

Radio Control **CAR ACTION**

THE WORLD'S LEADING R/C CAR MAGAZINE

pg. 22
47380

November 1995

Losi's Incredible XX and XXT Budget Racers

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Crazy R/C stories



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Trinity's Midnight

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**TESTED
IN THIS
ISSUE**

OFNA

■ Ultra Gas Buggy

TAMIYA ■ Isuzu Amigo

■ ProMarkt Mercedes

**BUDGET
RADIO
GUIDE**

19
models
compared
PAGE 102

ON THE COVER: The latest offering from Team Losi—the Double-X and Double-XT entry-level racers (photo by Walter Sidas). This page: Dave Vera's troll driver pounds the parking lot in Miami (photo by Rick Schwartz).

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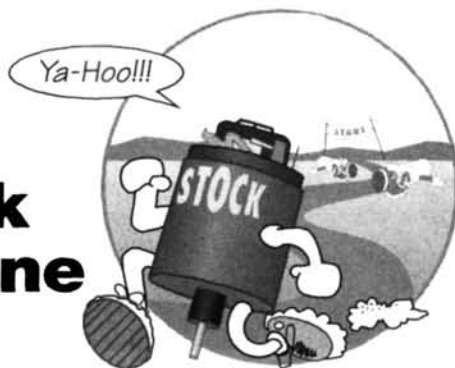
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Gas racers take the Dallas track by storm

by Chris Brame

EDITORIAL

Have Stock Motors Gone Too Far?



Stock motor development has been under scrutiny lately. Some proponents of "fair" racing have said that today's generation of high-tech stockers is too powerful, and as such, takes equality out of the stock class. I say that the best equalizer is having too much horsepower.

Feel free to disagree, but all R/C car hobbyists, even those who strictly use stock motors, want to go fast. It's my opinion that, given the choice to compete using equally matched, but slower stock motors—such as the Mabuchi and the old Igarashi—most would rather have a higher element of speed.

On occasion, we editors get together to race our touring cars. At first, we ran using the stock 540 motors that came with the kits. The racing was equal, but a high-drag 4WD drive train combined with a long race-course drove one point home: for us, the speed just wasn't there with the 540; racing was equal, but we needed a speed fix. So we each began to run with a 15-turn, fixed-endbell motor that had bushings—basically, a "stock" motor that simply had fewer winds on its armature. Cost is still comparable (our motors list for \$36), but now we don't long for more speed on the straights, and we're still on equal ground.

In case you're wondering, our races last for about 5 minutes, and run time has never been a problem (as a kind of "club" battery, we use inexpensive spec-racing packs, each of which is charged and discharged several times a day).

And I haven't forgotten about equality. Remember going through five or six stock motors in search of that one "gem?" How about water-dipping (the ancient art of breaking in a motor's brushes) several Igarashis hoping that at least one of them had been "drowned" for exactly the right length of time? Most of today's stock motors are built to exacting specifications and are dyno-tested to ensure that they're all gems.

As long as current stock-racing rules dictate the use of 27-turn armatures, I say let the manufacturers spend as much as they want to make the fastest mega-stocker. We are the beneficiaries of this technology; we get stock motors that are nearly as powerful as the modifieds of "yesteryore," and, because of innovations such as thicker cans and better magnets, cooling-endbell designs and armature heat sinks, the life of a properly geared and maintained motor is longer than ever before.

To demonstrate just how far stock motor technology has come, we've included a feature written by John Howell on the latest offering from Team Trinity—the Midnight. This new stocker is reputed to be the fastest ROAR-legal, 27-turn motor ever produced, and if Trinity's claims are true, this will be the motor to have during the coming year's racing.

For those of you who are less interested in the latest hardware and more interested in keeping your motors running in tiptop shape, check out this month's "Getting Started" column by Brian Leslie; it has all the vital info you beginners need to maintain your electric motor properly—all written in an easy-to-understand way that has become the trademark of this column. Regardless of your skill level and experience, we guarantee that this issue has more than enough to satisfy your R/C appetite.

Frank Masi, Executive Editor

We want to hear from you! Write, fax, or e-mail us over the Internet: Car Action, Air Age Publishing, 251 Danbury Rd., Wilton, CT 06897; fax: (203) 762-9803; e-mail: Chris Chianelli—chris@airage.com; John Howell (Doog)—johnh@airage.com; John Huber—jhuber@airage.com; Frank Masi—frankm@airage.com.

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LETTERS



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SEDAN SALVATION

Perfect timing for the article on popular sedans! ("Sedan Slam" August '95). I had been thinking about buying a TA01 with a Michelin Pilot Ford Escort body, but I've been swayed to buy a TA02. What body styles does it come in? Also, is it possible to purchase an additional body shell by itself? As always, great job on the article, and any help you could give would be greatly appreciated.

KEVIN STRAIT
Strait159@aol.com

Thank you for the kind words, Kevin. There's no doubt that sedans are hot, and Tamiya's are among the most popular—especially the TA02, of which there are quite a few models available: Opel Calibra V6 DTM, Blitz Toyota Supra Gr.N, Alfa Romeo 155 V6 TI, AMG Mercedes-Benz C-Class DTM D2, ProMarkt-Zakspeed, AMG Mercedes C-Class DTM and Castrol Celica. All these body sets are available separately from Tamiya and include all accessories, e.g., mirrors, wings and decals.

Tamiya will soon release a chassis-only version of the TA02. It has all the factory hop-ups that the hot parking-lot racers use, such as bearings, front one-way drive, upgraded springs and trick tires. Word has it that this kit, which comes without a body set, will be priced at about the same as other TA02 kits that include body sets.

Frank

CLASS SEPARATION

In response to the editorial in the August '95 issue, I don't believe we need to separate the factory drivers

as a solution to the competition problem. I think that creating a spec class of racing for off-road (along the same lines as Trinity's spec class) may satisfy the people who want to race against others with like equipment and who want closer performance. We have CRC (cost-controlled racing) for on-road but not for the larger market of off-road! If the manufacturers were to create a spec vehicle, I know that I would buy the kit and push our club to create the class.

JAMES PETERSON
Member of SCORE
(host of the 1995 ROAR Modified Nationals)

I can't think of anything more important than maintaining a healthy "sportsman" or "beginners" racing class at a local track: it is the only way to ensure that newcomers aren't blown off the track by the more seasoned drivers with the big wallets. However, I think that isolating the factory drivers from the general population at larger-scale events is ridiculous. If all the drivers who were consistently better than me were placed in a "factory" or "professional" class, I would be racing alone. As for factory drivers having access to the newest parts, I believe that most of the drivers who whine about not being able to buy a "titanium-modular-chassis-sway-bracket" haven't even learned how to get maximum benefit from the over-the-counter modifications that they already have. Practice more, whine less, and let the "sportsman" classes and the cost-controlled racing stay at the local track where they are needed.

My two cents,
J. ALLEN VEITCH
jveitch@nmsu.edu

Obviously, we've touched a nerve. How 'bout it readers? Got an opinion on the subject of separating the pros from the amateurs? Your voices are the ones that may sway the racing organizations, so let us know how you feel!

Frank

BIG POWER

I want to run a 4400mAh battery in my Tamiya Mountaineer. Trinity has a 7.2V pack, but I want to know if there is an 8.4V 4400 or higher mAh

WRITE TO US! We welcome your photos, drawings, comments and suggestions. Letters should be addressed to "Letters," Radio Control Car Action, 251 Danbury Rd., Wilton, CT 06897-3035. Letters may be edited for clarity and brevity, and each must include a full name and address or telephone number so that the identity of the sender can be verified. We regret that, owing to the tremendous numbers of letters we receive, we can't respond to every one.

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LETTERS

pack available. Will the Bruiser/Mountaineer handle 8.4 volts? What type of electronic speed control will be best for it? Please help! There isn't much information available for us Bruiser/Mountaineer owners. Yours is a great mag, and it keeps getting better. Keep up the good work!
KENNETH BRENNAN

As long as you can find a place to put the cells, you can run a 4400mAh pack in the Mountaineer. You can make an 8.4V pack by adding another 4400 cell in series, but you'll probably do fine without it. As for cells with a higher capacity, they are made, but you will start to have some other problems. Basically, 4400 cells are D-size rechargables. I've seen F-size cells (7000mAh!), but they are huge! First, they weigh more, and that will slow you down. Second, the increased capacity means that they will run longer and heat up more. Go for the 4400mAh

6-cell pack. You should get about a half hour of run time with good speeds as well. For an ESC, get a Tekin 411-G or, if you want reverse, a 610-G.
John

GLOW-PLUG GLOOM

I recently purchased an RC10GT. The truck is great, but my glow plugs burn out after two or three runs. I know they should last longer; at least, I hope they should! It's getting kind of expensive. I have an O.S. CZ-R engine with an MIP "Headsink," and I use no. 8 glow plugs. Please help!
Jonny76827@aol.com

I use only McCoy MC-59 and MC-9 plugs. They last for a very long time! Get them, and be done with the problems.
John

READERS' RIDES REVISITED

You ran a picture of my R/C car in the "Readers' Rides" column in the

December issue. I was under the impression that I was the lucky recipient of a one-year subscription upon publication of the picture, but I haven't received any copies yet.

Am I mistaken, or has my name fallen between the cracks? If the latter is the case, please pull it out of the crack and put it on your subscription list.

Thanks a bunch. Race on!
GARY O'CONNOR
Santa Rosa, CA

Sorry, Gary, it's on the way. Sometimes we accidentally overlook someone when we're giving out our complimentary "Readers' Rides" subscriptions. On the other hand, once in a while we get some really killer "Readers' Rides" entries, and the entrants have forgotten to put their full address on the envelope, so we can't get in touch with them. So, everybody remember to put your full name and address on the envelope, and we'll do our part!
Doogie

SPEED METAL

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BIG-TRUCK LISTS

I'm interested in building the Project Big Truck 2, and I'm wondering if you could make two lists for me. On the first list, I'd like to know all the parts you used and the price of each part. (Please specify whether it is the list price or the price you paid for it.) On the second list, I'd like for you to exclude any unnecessary, expensive parts and to include any parts that can be replaced by less expensive parts. Thanks.

JEFF ARNDT
Woodbury, MN

Well, Jeff and everyone else who has asked for a parts list, here's the deal. Your best bet is to call Eric Sutcliffe at ESP (815) 455-5440 and Larry Bennett at Bennett Equipment (317) 538-2725. These guys will be able to give you great monster truck advice and will steer you toward building the best monster truck that you and your budget can handle.

Doogie

Errata: in "95 U.S. Oval Masters" (August 1995), we wrongly identified the Oval Masters Novak Invitational 500 winner in the photo caption. The correct name of the winner is Jimmy Simmons. We're sorry, Jimmy, and, once again, congratulations!

BRIGHT LIGHTS, BIG TRUCK

This neon ride comes from Rich Vestuto of Commerce Township, MI. He began with an ESP Clodzilla II chassis. He tells us that building the truck was easy, and he recommends using Loctite on everything. A Tekin 420 ESC and an 8-cell pack supplied by Perfect Match round out the electronics department. The truck is powered by two Trinity Onyx motors, one of which has been modified for reverse rotation. Rich also explains that his buddies over at Looking New custom-designed the neon lights and supplied the transformer that runs them. To finish off the truck, Rich added some cool tires and hand-painted some of his favorite cartoon characters on the body.

Great job, Rich!



R/C ADDICTION

About a year ago, Jan Hendrickson of Centerburg, OH, went to a carpet oval track and became hooked on R/C. Jan sent us this photo of his first ride—an Associated RC10 for which he has bought many hop-ups, including a Novak ESC, RPM ball-bearing steering, a Barracuda direct drive, a Litespeed heat sink, Tecnacraft tie rods, Pro-Line Striker tires, a Trinity Green Machine 2, a Dahm's Champion body and ESP batteries. He has also purchased an F1 car and a 10LS NASCAR. He says that these should keep him busy on race day. By the way, Jan, we all enjoyed the candy bar!

"Readers' Rides" is our way of recognizing the unique, innovative—and sometimes bizarre!—vehicles that our readers have created. Send us a sharp, uncluttered, well-exposed color photo of your car or truck (no Polaroids, please!), along with a brief description, to Readers' Rides, R/C Car Action, 251 Danbury Rd., Wilton, CT 06897. If we choose your photo, you'll receive a 6-month subscription to Car Action, or an extension of your existing subscription. You'll also be eligible for the fourth annual "Reader's Ride of the Year Contest" in the fall of 1995. Write your address and phone number on your letter and on the back of each photo you send, in case we need to contact you.



TAR-PIT TERROR

Straight from a B-movie set in Great Falls, MT, lumbers Luca Zahara's one-eyed, two-horned, rolling, bright green "people-eater." This critter from the black lagoon rides on top of a custom-built Kyosho USA-1. It's equipped with a Thorp diff, full ball bearings, DuraTrax Gold shocks, Futaba radio gear, a Novak Rooster ESC and two Ultima steering kits. The "Ramota" made its debut at the seventh-grade science fair where it earned an "A." It is currently accepting all low-budget horror-film scripts.

WICKED WORLDS CAR

This hot ride comes from Chris Taganas of Los Angeles, CA. His Associated RC10 Worlds car is equipped with MIP titanium Gold shock shafts, Lunsford Punisher titanium turnbuckles, a Novak Hammer Pro ESC, an Airtronics XL2P transmitter and a Sonic "Mr. M" 13-turn double.

Chris says that he races at the Ranch Pit Shop and has a great time. Well Chris, here's your ride. We hope you won the bet.



...SITTIN' IN A TREE, R-A-C-I-N-G

These confused rides from Dan "Fish Man" Martin and Vince Pau of Mississauga, Ontario, Canada, give new meaning to the term "off-road." The RC10GT features a Dynamite .12 engine, Futaba metal gear servos, Robinson spur gears, Pro-Line Dirt Hawgs in back and Associated tires up front. The Double-XT is equipped with a Trinity Ex-Tech 13-turn triple, a Novak Duster ESC, a Trinity 7-cell battery pack, MIP CVDs, Pro-Line chrome wheels and Dirt Hawgs and Lunsford titanium turnbuckles. Apparently, they got a bit lost on the way to the track; either that, or the neighborhood dog gave them a run for their money.



BLACK AND WHITE AND FAST ALL OVER

David Looye of Ft. Polk, LA, sent us this photo of his highly modified Kyosho Double Dare. This beast sports Futaba radio gear, a Novak Stutter Stopper, a PDI Turbo Zeta ESC, Trinity Monster Mash motors and three battery packs, two of



which have been wired together for more run time. It also features Thorp ball diffs, Thorp dogbones, Pro-Line tires, a Pro-Line Nissan truck body, full ball bearings, an aluminum chassis, Kyosho suspension arms, Kyosho long Gold shocks and much more! David claims, "It's faster than a speeding grasshopper and able to leap an RC10 in a single bound."

REEBOK RACER

Nicky Carlin of Nottinghamshire, England, decided that this Mardave Meteor—equipped with a Parma K stock motor and a Tamiya speed control—needed a new look. So he got some cardboard and sticky contact paper and designed his very own van body. He added a piece of clear plastic for a windshield and a driver from a Super Hornet. The Meteor sports a spare tire, four rear lights and a license plate. And the beauty of it all is that, when it has finished racing, he can flip it over and store his sneakers, baseball cards, hamsters, etc.!



BONES AND BUGGIES

Inspired by Readers' Rides and other home-built projects, Devin Coppieters of Raymond, Alberta, Canada, decided to build his own gas buggy. After a little more than a year of designing and building, he finally finished his work of R/C art. Powered by an SRT .21 engine, it's equipped with Airtronics radio gear, an Airtronics 91402 servo that handles throttle and brakes and a Futaba S9301 steering servo. The roll cage is made out of 3/16- and 1/8-inch-diameter steel rods, and the chassis is made out of 1/8-inch-thick aluminum. Devin's driver of choice is his model skeleton.

In search of fun
and glory, cause
life's too short
to be a sheep • by Chris Chianelli

INSIDE SCOOP



NEWS BRIEFS



The Magic Switch

No, these guys aren't blushing! They're happy and sunburned—both conditions a result of the ROAR 1995 On-Road Nationals. From the left: Jaco's Jack Rimer, Team Trinity driver Joel Johnson and Pro-Line president Todd Mattson. The big news is the big switch. Joel, who won the 1/12-scale Modified title running his Trinity-powered Revolver 22-J, switched to Pro-Line's new Jaco 1/12-scale wheels

and tires. His compound choices were purple fronts and pink rears. Seven of the 10 1/12-scale finalists used Pro-Line/Jaco racing tires, and eight of the 10 ran the Protoform Nissan P-35 body. Congratulations to Trinity, Pro-Line and Jaco-Joel on their victory. Oh, yes; by the way, they're red because the Nats was held in the southern Florida town of Naples—alligator-alley, to be more exact.

Who makes the wildest, most accurately detailed, R/C scale subjects in the industry? No contest; Tamiya does. Take the 4WD Hummer, for instance (which, by the way, is manufactured under license from AM General). I've held this 1/10-scale military-machine body in my very own solder-scarred hands. It's a shining example of the highly

detailed, state-of-the-art injection molding



tor is big-scale realism at its best. Like its American cousins, the Euro-hauler can shift gears on the fly using an optional 3-channel radio.



The Scale Masters

Last, but not least, is the diminutive Abarth 1000 TRC Berlina, which was an all-out racing version of the venerable Fiat 850 sedan that was so popular in Europe. One of Tamiya's M-chassis series, the Fiat Abarth is a rear-motor, rear-wheel-drive version of the Mini Cooper. If *this* trio doesn't exemplify Tamiya's ability to accurately create diverse scale subjects of extremely high quality, I don't know what does.

that does this "Go anywhere; do anything" military scale subject justice. The scale wheels and lug-pattern tires complete the picture and are just as functional in 1/10 scale as they are in full scale. In the Hummer, Tamiya employs a slightly modified version of their proven shaft-drive TA01 4WD chassis.

Now let us look, shall we, at this awesome Euro-hauler rig. Using the same basic, front-motor, aluminum chassis as the King Hauler and Globe Liner, this 1/14-scale Mercedes-Benz 1838 cab-over trac-



A Little \$ Gets a Lot



The new 1/8-scale Kyosho Inferno MP-5 is, in fact, *all new!* Check it out. For superior handling, the MP-5 features a 2.5mm-thick, gold-anodized chassis (with 8-degree front kick-up built in!); a 6-degree kingpin design; and a more central engine position for vastly improved weight distribution. I'll tease you with a few other new goodies; how do a waterproof box for the receiver and Ni-Cds, a new body, plastic side guards, and smaller-diameter diffs giving lower CG and lower rotating mass sound? How does all this for only 20 bucks more than the Turbo Inferno sound? If that didn't just widen your eyes, it must be early in the morning and you haven't had your coffee yet. Review coming soon—very soon.

CLEAN SPEEDWAY MACHINE

Trinity's new adjustable body mounts feature a screw to hold the body on—no ugly post or clips (which always get lost anyway) to dirty up the aerodynamics. This is the way the factory pros mount their bodies for less drag. The body posts

are threaded so that the lightweight alloy tops can be positioned and secured with a setscrew—exactly where you need them. Comes four pieces to a package sized for stock-car bodies. Contact Trinity Products Inc., 1901 E. Linden Ave. #8, Linden, NJ 07036; (908) 862-1705; fax (908) 862-6875.



2 for a Lot...

...parking lot, that is. On the right is Kyosho's new TF2, which is available with either an Opel Calibra or a Toyota Supra GT body; and above is HPI's latest—the RS-4. The pictures speak for themselves. Both look like formidable designs featuring open belt drive. Stay tuned....



Kinwald Delivers Power And Precision.

Team Kinwald brings you new ways to go fast. The BuggyWald™ off-road modified motor delivers heavyweight performance on a lightweight budget. And, Kinwald "Hard Ones"™ hardened steel pinions turn out precision and long life like no other.

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"If my first Modified Motors had been this fast, I'd been World Champion a lot sooner."

—Brian Kinwald
Current IFMAR World Champion



The "Hard Ones"

Team Kinwald brings you the new "Hard Ones" off-road steel pinions. With a Zero Gravity™ design, each pinion is case hardened to a 58-62 Rockwell C hardness to a consistent depth of .0010". Only total destruction would cause tooth deformity. Last, a black oxide coating is applied to prevent rust prior to use. Kinwald "Hard Ones" are the longest lasting pinions available. In 48 pitch only, 12 - 27 tooth sizes. Only \$4.99.



TEAM KINWALD BY TRINITY®

1901 E. Linden Avenue, #8, Linden, NJ 07036 ■ 908.862.1705 ■ Fax 908.862.6875



Nitro Stampede

Here are two spy shots of the latest from Traxxas—their new, .12 gas-powered Stampede monster truck. The nitro Stampede combines all the cool monster truck features of the electric Stampede (such as fully tunable, long-travel, independent suspension arms with oil-filled coil-overs; exceptional ground clearance; and planetary diffs) with the power of the dual-exhaust, recoil-start TRX-12 glow engine. The differences between the electric and nitro



Stampedes—besides the TRX-12, of course—are: super heavy-duty .8-pitch metric gears; disk brake; and combination T-6 aluminum and composite chassis. From the looks of it, this

thing will even withstand the frantic antics of a crazy nut like me! We'll see.... Available with or without a Traxxas radio system. Sorry about the boring monochromatic prototype body, but sometimes that's the price we pay to get an advanced look at the latest stuff.



A Classic Pickup Line...

...line of pickup trucks, that is. This new 1/10-scale '49 Custom Ford pickup truck is a very pretty addition to Bolink's Classic Pickups line, which also includes a '40 Ford and a '53 Chevy. For more information, contact Bolink R/C Cars Inc., 420 Hosea Rd., Lawrenceville, GA 30245; (404) 963-0252; fax (404) 963-7334.



Astro & the Family Dog

For those of you who regularly take the family to a Sunday race, here's HPI's new 1/10-scale Ford Astro van—shown here with HPI's 3-spoke wheels. The heavily tinted windows keep the family dog cool in the hot summer sun.

GET A GRIP.

Gettin' sideways is cool if you're running dirt oval, but if you're racing on carpet or asphalt, it doesn't cut it!

To improve foam tire performance on hard surface tracks, the race team worked with the chemical engineers at Trinity to develop Zip Grip™, a custom, hand blended R/C foam tire traction compound.

Using Zip Grip provides the most precise and repeatable tire performance on carpet or asphalt R/C racing tracks, of any formula available today. And, the new style applicator keeps the Zip Grip on your tires and off your hands.

So if you've been getting entirely too familiar with the turn marshals, it's time to "get a grip" with Zip Grip!

TRINITY®

1901 E. Linden Avenue, #8, Linden, NJ 07036 ■ 908.862.1705 ■ Fax 908.862.6875



Top-Secret Team-A Tests!

When we heard a rumor that Team Associated was secretly testing its newest off-road buggy at various tracks throughout Southern California, we sent our ace spy photographer "Snoop Doogie Dog" out there to get the goods—at all costs! After spending two weeks in the blistering sun and downing way too many 7-Eleven Big Gulps of the Mountain Dew variety, he staggered back into our office. Before he slipped into a caffeine-

induced coma, he handed us the film and uttered, "The guys at Associated tried to run me down with their box van when they found out I shot photos of the car. I've been on the run ever since."

So what you see before you, folks, is Associated's new RC10B2. As you can easily see, the Buggy is 100-percent different from the old Team Car. Check out the accompanying photos of team driver Steve Chamberlin's car for more info.

1
From this view, you can tell that something new and exciting lurks beneath the body...



2 ...but not until you pop off the body can you see that the car has a completely new design from the ground up. The most easily identifiable new item is the molded plastic/carbon-fiber composite chassis. That's right! The aluminum tub that we've all come to know and love has not been incorporated in this car's design.

3. The molded chassis features kicked-up sides that give the car more ground clearance when cornering. **4.** The RC10B2 gives you the option of removing either the entire rear end (suspension intact), or only the transmission (by removing a few screws from the aluminum plate). **5.** Up front, long suspension arms and long, hard-anodized shocks should allow the RC10B2 to soak up the bumps on the roughest tracks. The B2 has more nose clearance than its predecessor, so it can slam into the face of jumps and soak up landings better. **6.** This prototype buggy has the older, Stealth tranny design. The RC10B2 will have a redesigned Stealth tranny that will feature a larger, more durable differential.



WHAT'S new

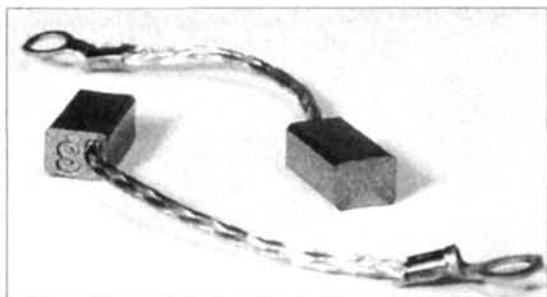
TAMIYA

1/12-Scale Hummer

This highly detailed, injection-molded, hard-plastic body combines military model making with advanced 4WD R/C technology to replicate the full-size all-terrain vehicle right down to its slope-backed silhouette and rooftop turret (minus the weaponry). It's based on a modified TA01 4WD chassis; the wheelbase and suspension arms have been lengthened to maintain scale accuracy.

Part no.—58154; price—\$300.

Tamiya America Inc., 2 Orion, Aliso Viejo, CA 92656-4200; (800) Tamiya-A; fax (714) 362-2250.



TRINITY Street Spec Brush

This unique brush brings stock racing back to a level playing field. Everyone runs the same brush, therefore all the motors run a lot closer to one

another. Easily identified by its silver- and copper-colored shunts and molded letter "S" on the back, this easy-to-tech brush works well in all forms of stock motor. It's also mandatory for all Street Spec races.

Part no.—SS2229; price—\$2.99/pair.

Trinity Products Inc., 1901 E. Linden Ave., #8, Linden, NJ 07036; (908) 862-1705; fax (908) 862-6875.

REEDY MODIFIEDS

Ultra Sonic Motors

These motors were developed for those who prefer the power band of a small commutator. The Ultra Sonic uses the same can and magnet as the world-champion Sonic, and it also features a standard commutator for an rpm-oriented power curve. The supplied brushes are designed for maximum life.

The motors are available in a variety of winds to meet all your 2WD and on-road needs.

Part nos.—560 (12-turn double), 561 (12-turn quint), 562 (11-turn quint), 564 (13-turn quad), 565 (13-turn double), 566 (13-turn quint), 567 (14-turn double), 568 (14-turn quad), 569 (15-turn quad), 570 (16-turn quad); price—\$85 each.

Reedy Modifieds; distributed by Associated Electrics, 3585 Cadillac Ave., Costa Mesa, CA 92626-1403; (714) 850-9342; fax (714) 850-1744.



C&M/TEAM COBRA Probe 4000

This new battery-discharge system can discharge single cells and entire packs. It features variable cut-off voltage; microprocessor control for maximum accuracy; a massive heat sink for maximum cooling;



and a large liquid-crystal display that displays run time and average voltage. All settings are done on-screen by using the soft-touch pad.

Price—\$274.95.

C&M Mfg. Inc./Team Cobra, P.O. Box 701-353, W. Valley City, UT 84170; (801) 974-5757; fax (801) 974-0869.

PRO-LINE/JACO

F1 MOUNTED AND TRUED FOAM TIRES

These tires are designed to fit all Tamiya F1 cars. Ready to bolt on and go, the tires are available in standard and exotic compounds to cover everything from parking-lot to carpet racing tracks. They feature a 1.41-inch high-performance composite wheel.

Part nos. and prices—Standard: 2275 (green, medium, front) \$14.95, 2276 (blue, firm, front) \$14.95, 2278 (green, medium, rear) \$16.95, 2279 (blue, firm, rear) \$16.95; Exotic: 2280 (pink, medium-soft, front) \$24.95, 2281 (purple, medium-firm, rear) \$27.95, 2282 (white, medium, front) \$20.95, 2283 (white, medium, rear) \$22.95, 2284 (purple, medium-firm, front) \$24.95, 2285 (pink, medium-soft, rear) \$27.95.

Pro-Line/JACO, P.O. Box 456, Beaumont, CA 92223; (909) 849-9781; fax (909) 849-2968.



HITEC

HS-422/HS-425 Servos

These servos feature custom-integrated circuitry and SMT construction and have a torque rating of 43 oz.-in. and a speed of 0.20 seconds for 60 degrees of rotation. You also get 1/4-degree centering accuracy with your choice of dual Oilite bearings (HS-422) or dual ball bearings (HS-425). Offered in a sturdy glass-filled case, these servos are suitable for steering and throttle control for



most 1/10-scale cars and trucks.

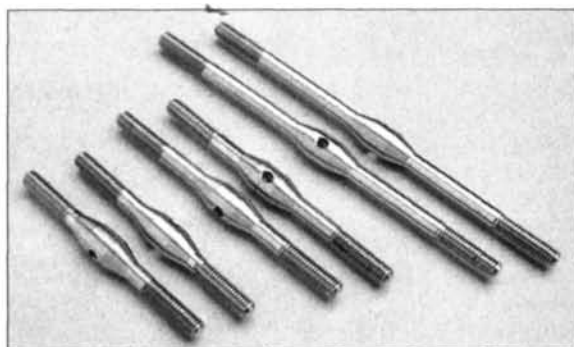
Part nos.—HSE0422#, RCD910#, HSE0425#; prices—\$19.95 (single HS-422), \$83.95 (pack of four HS-422 with charging switch harness), \$28.95 (single HS-425). Specify connector style when ordering.

Hitec/RCD Inc., 10729 Wheatlands Ave., Ste. C, Santee, CA 92071-2854; (619) 258-4940; fax (619) 449-1002.

KYOSHO

Titanium Turnbuckles

These strong, lightweight turnbuckles feature a groove for easy identification of left-hand thread versus right-hand thread. They are designed to fit many Kyosho vehicles such as the Pro Series, the Inferno 10, the Lazer ZX-R and the GP-10 Spider Series. They will also work in



steering linkages and suspension-arm applications for many other car and truck kits.

Part nos.—KYOC6200 (30mm), KYOC6201 (34mm), KYOC6202 (38mm), KYOC6203 (42mm), KYOC6204 (46mm), KYOC6205 (50mm), KYOC6206 (68mm); **prices**—\$11.99, \$13.99, \$11.99, \$13.49, \$13.49, \$16.99, \$16.99.

Kyosho/Great Planes Model Distributors, P.O. Box 9021, Champaign, IL 61826-9021; (217) 398-6300; fax (217) 398-1104.

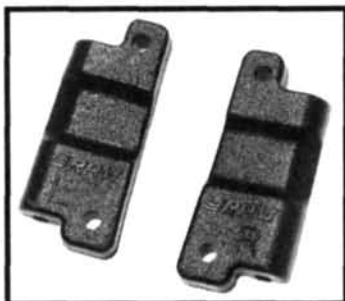
RPM

3-Degree Rear Mounts for the RC10T2

These molded, black, durable mounts feature the same geometry as the stock rear mounting blocks. Made specifically for the T2, they have only the two screw holes necessary for mounting them to the chassis; all the other holes were eliminated to increase strength and decrease the number of places where dirt could be caught. The pair of mounts comes with four thin, black jam nuts to ensure a firm mount.

Part no.—7062; **price**—\$5.95.

RPM, 14978 Sierra Bonita Ln., Chino, CA 91710; (909) 393-0366; fax (909) 393-0465.



PARMA

1995 FORD EXPLORER BODY

This detailed, 1/10-scale body is made of 0.040 clear Lexan and will fit most monster-truck chassis. For an awesome scale look, it will also fit Parma's Goodtimes Kit chassis.

Part no.—10391; **price**—\$19.

Parma Intl. Inc., 13927 Progress Pkwy., North Royalton, OH 44133; (216) 237-8650; fax (216) 237-6333.



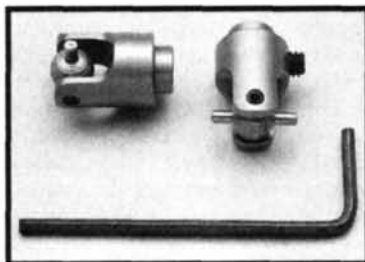
TRAXXAS

Hardened-Steel Differential Yokes

These output yokes put an end to drive-shaft problems that occur with high-current, high-torque motors. The yokes are simple bolt-on replacements for the stock output units on the Rustler, the Stampede, the SRT, the TCP, the Hawk-2 and the Rad-2. An installation wrench is included.

Part no.—4628X; **price**—\$19.50.

Traxxas Corp., 12150 Shiloh Rd., #120, Dallas, TX 75228; (214) 613-3300; fax (214) 613-3599.



DYNAMITE

Thermal-Set Coupler Tape

This tape is designed to virtually eliminate exhaust-coupler blowout. It integrates a heat-activated resin in its construction; the resin aggressively bonds to the coupler when the



exhaust system heats up and makes the coupler

impervious to heat, vibration and crash damage. It comes in a 20-foot roll, which is enough for 20 couplers.

Part no.—DYN2264; **price**—\$8.95.

Dynamite; distributed by Horizon Hobby Distributors, 4105 Fieldstone Rd., Champaign, IL 61821;

(217) 355-9511; fax (217) 355-8734.

NIFTECH

Blast Off! Motor Cleaner

This cleaner is chemically engineered for today's high-speed electric racing motors. The forceful spray action dislodges oil, grease and dirt from the motor and leaves no residue. It dries in seconds, is safe on plastics, doesn't contain CFCs or any substances known to harm the ozone layer and is economically priced.

Part no.—4500;

price—\$6.95.

Niftech, 5565 Wilson Dr., Mentor, OH 44060; (216) 257-6018; fax (216) 257-4281.





TROUBLE SHOOTING

by John Huber

HEAVY HORSEPOWER

I want to use an RX-B competition engine on a Kyosho USA-1 nitro truck. I've been told that the RX-B engine would give me a serious gear-stripping problem because of the engine's high rpm and torque.

Is there a 2-speed option (like the one for the HODR Blazer Ultra or the Kyosho Inferno 10) for the USA-1 truck?

Could an existing one be applied to it? Can it be done? Is there one available? Would this eliminate the gear-stripping problem?

ADRIAN DURAN
Zapata, TX

I called Great Planes on this one, and they confirmed the gear-stripping problem that you mentioned. There is a solution: hardened gears for both gearboxes. The stock metal gears in the gearboxes are made of a soft metal and, eventually, they'll fail when used with the powerful RX-B. Hardened gears will solve the problem. The main spur gear will probably hold up, but if it also fails, a steel version is

available. The 2-speed option is out of the question. It can't be used with the gear-reduction unit used in the USA-1 that compensated for the huge tires. Chuck the RX-B in the truck and,

although I think you'll be happy with the performance, keep in mind that the USA-1 was not designed to be a rocket, but rather a monster crusher.



OIL, OIL EVERYWHERE

Help! I just bought a new RC10GT team truck, and I have only one problem with it: the shocks leak only (get this) from the top. Now, I haven't been in this hobby for that long, but the last time I checked, if shocks leak at all, they aren't supposed to leak this way. The main problem is the back two shocks. I own another Team car, so, basically, I knew what I was doing when I put the back shocks together. When I filled them with oil, set the piston the correct way down the shaft and screwed the top on as

tightly as I could with my hands, I compressed them to see how much rebound they had so that I could tune them. Oil came oozing out of a specific place on each of them. I checked the O-rings around the top, and they were fine, so I took the shocks apart and followed each step of the directions when I put them back together, and they still leaked. I tried letting the oil ooze out until it got to a lower level. Even though I filled the shocks with the right amount of oil, it still

came out. What's my problem? Your help would be very much appreciated!
PETER SCHEU
Lancaster, VA

Pete, I have never heard of such a problem, but I think I can help anyway. First, get a set of RPM shock tools for the Associated shocks so that you can tighten the shock caps properly without damaging the shock's aluminum body. If this doesn't solve the problem, use new O-rings for the shock tops, and try again.

As a last resort, try some Teflon™ plumbing-thread sealant (available at hardware stores) along with the O-rings. Make sure you clean the

shocks well with motor spray after assembling them. This makes it easier to tell if oil is leaking or is just left over after assembly. There's a slight possibility that the shock caps or the bodies may be defective. Try using another set of caps or bodies to determine if this is the case. If the parts are defective, contact Associated right away.

If you have a technical problem that your hobby shop or racing friends can't resolve, give us a shout at Radio Control Car Action, and we'll see if we can chase down an answer for you. Questions should be of a technical nature and should be addressed to Troubleshooting, Radio Control Car Action, 251 Danbury Road, Wilton CT 06897. We regret that, owing to the tremendous number of letters we receive, we can't respond to every one.





TOO OLD TO COMPETE

Recently, I acquired a very old, slightly modified, Associated RC10 buggy. The aluminum tub had been replaced with a flat fiberglass chassis. It dates back to around 1984.

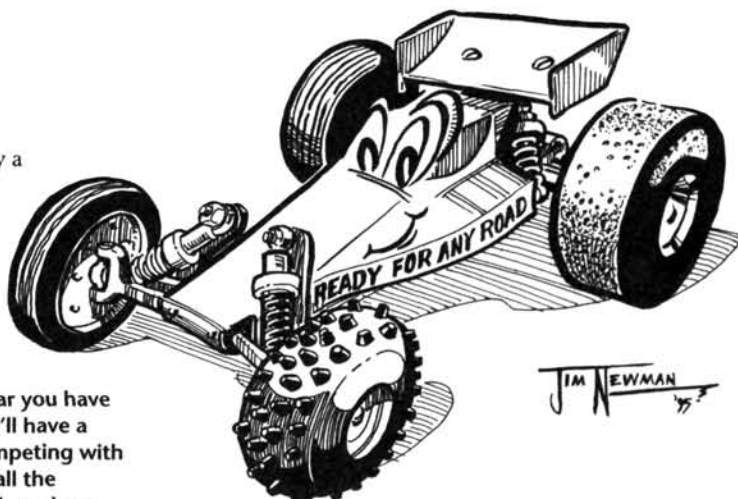
I got started in the hobby with on-road oval racing and haven't really done much with off-road. The buggy is great; I can put foam, buggy or truck tires on it, so I can mess around with it everywhere. I was thinking of trying to race with it. Is it possible to be competitive with a buggy this old, and what must I do to make it so? If it's not possible,

maybe I'll buy a new one.

Thank you for your help.

KEITH FAHLGREN
Midland, MI

Though the car you have is decent, you'll have a hard time competing with it because of all the changes that have been made in the last decade. The new Associated Worlds car has many refinements that you could add to your car, but you'd end up spending more on parts than you



JIM NEWMAN

would on a new car kit. The new kits come with a better transmission, longer front arms, much better shocks, newer rims and tires, universal drive shafts and stronger nylon

parts. If you want to be competitive, you'll save money in the long run by buying a new car from the start.

MELTDOWN

I own an LX-T with the Double-X transmission. It has a Novak Duster ESC, a Futaba Magnum Sport, a Reedy Modified Sonic G with a 22-tooth pinion and an 88-tooth spur gear, MIP CVDs and MIP diff balls. Every time I run my truck, the center diff gear melts in about 5 minutes. When I open the transmission, the diff balls are molded into the sides of the diff gear. Help! I don't like spending \$5 on a new center diff gear every time I run my truck. Thanks a lot. Great mag.

FRANCIS CHAO
Coral Springs, FL

If you're melting the gear that quickly, then something is seriously wrong. First, check that the diff has been tightened properly. The instructions should cover how to check the tightness; make sure it's right before you run the car. Some time ago, someone else wrote to us about a similar problem, and Losi suggested that a bearing in the diff was in the wrong place. Here's what I suggest: completely disassemble the tranny, and set all the bearings aside. Double- and triple-check the bearings, and make sure you have them in the right places. Don't forget to check the bearing in the slipper clutch, too. Once you get the bearings in the right place, your troubles should be over.



JIM NEWMAN

FARM LIVIN'

I recently bought a Tamiya Chevy S-10. I live on a farm, and I'm forced to use my truck on gravel and dirt. It has no fenders, so dust builds up on the mechanical speed control and makes it malfunction. There is a cover over the moving parts of the speed control, but not enough to protect it. I live in Canada, and the least expensive ESC I can find is around \$120, which I can't afford right now. How can I protect the mechanical one?

JEREMY PUTNAM
Watson, Saskatchewan, Canada

There are several ways to keep the mechanical unit clean. One trick is to tape a piece of plastic bag over the tub chassis. Make it loose enough to allow the



JIM NEWMAN

servo to move freely, but try to seal the sides well with tape. The speed-control resistor gets very hot, so make sure it's exposed to cooling air, and keep the plastic away from it. Another option is to make some wheel wells out of cardboard or plastic bottles, and mount them on the chassis so they cover the wheels. The front wheels kick most of the dirt into the chassis, but you might want to cover the rears as well. Hope these ideas help. Good luck, and happy farming.



PIT TIPS

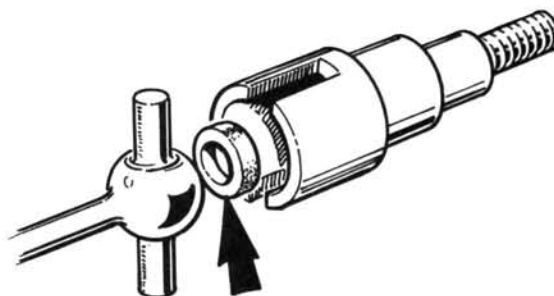
by Jim Newman



BUSHING CLEANER

Use cotton swabs to clean the insides of bushings and bearings. Caution: if you use solvent, do not use swabs that have plastic stalks; they'll dissolve.

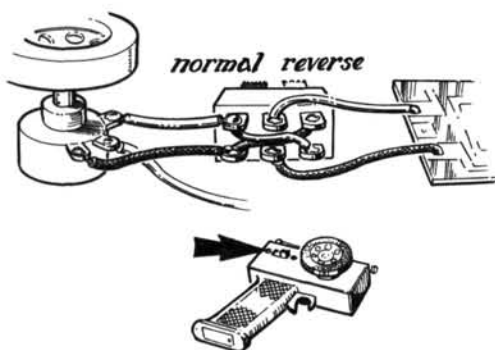
*David Lever,
Trenton, Ontario, Canada*



TAMIYA CELICA DOGBONES

To extend the life of dogbones, cut rubber rings out of fuel tubing, apply a small drop of oil, and push them inside the front housings.

Ryan Smith, Pickering, Ontario, Canada



SERVO-REVERSING SWITCH

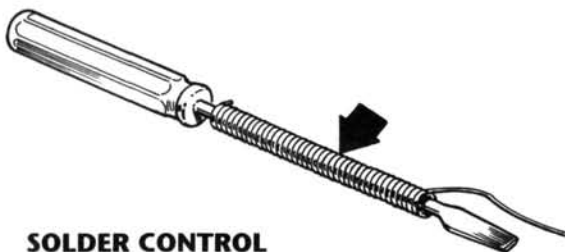
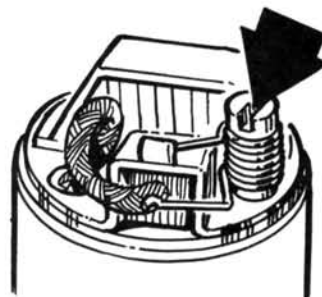
Cut the two wires shown at the steering potentiometer, solder them to a change-over slide switch, then mount the switch on your transmitter. Use a fine drawing pen to mark the switch positions. Caution: do this only if you're familiar with electronics, and remember that such alterations will void your warranty.

Ray Chu, New York, NY

E-Z OUT SPRING POST

Using a Dremel grinder, cut a slot in the top of your motor's spring posts. Now you'll be able to easily remove posts with a screwdriver.

Davis Oslinger, Mission Viejo, CA



SOLDER CONTROL

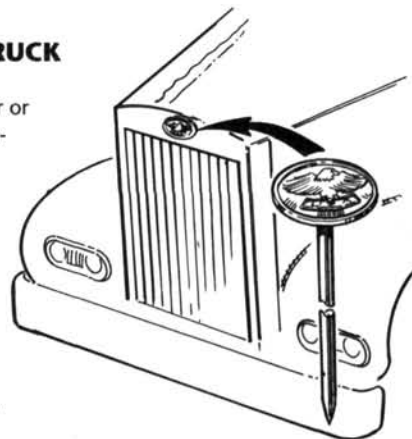
To keep your solder under control while it's in use, wind it around the shaft of a small screwdriver. Use the tip of the screwdriver to steady the components you're soldering.

Christopher Hyslop, Edison, NJ

CAR AND TRUCK GOODIES

Dress up your car or truck using accessories made of modified costume jewelry, such as hatpins or tie tacks. Affix them with Shoe Goo or PFM.

*Andrew Welburn,
Medford, OR*



Radio Control Car Action will give a one-year subscription (or one-year renewal if you already subscribe) for each idea used in "Pit Tips." Send a rough sketch to Jim Newman, c/o *Radio Control Car Action*, 251 Danbury Rd., Wilton, CT 06897-3035. BE SURE YOUR NAME AND ADDRESS ARE CLEARLY PRINTED ON EACH SKETCH, PHOTO AND NOTE YOU SUBMIT. We're unable to publish many good tips because we don't have the sender's name and address. Please note: because of the number of ideas we receive, we can neither acknowledge every one, nor can we return unused material.



Power and Security

This month, I'll look at a couple of new products for the nitro crowd out there.

First, is Futaba's* small, lightweight fail-safe unit. It plugs in between your servo and receiver and provides a selectable setting for the servo in the event that the radio signal is lost. Owners of Futaba's popular 3PB-PCM radio have enjoyed this feature for years, but it hasn't been an option for those with AM or FM radio systems. At last, there is another option for those with less expensive systems.

I always say that you need a PCM radio system for gas-powered models, simply because the fail-safe option can prevent your model from running away. Now you can add fail-safe to your Futaba radio, and I think it will work on non-Futaba systems as well.

O.S.* has a couple of new engines that are worth checking out. The first is the .21 RG—a replacement for the popular RF engine. The RG is

an affordable, entry-level engine with performance that rivals the RX-B's. It features a case design that maximizes cooling-surface area with large heat-sink fins and a large cooling head, and its new carb features a "screw-driver-adjustable" needle. It's available with or without a pilot shaft, and it produces 1.9b.hp at 30,000rpm.

If you need still more power, check out the new RZ series engines. They resemble the older RX engines but, for the headers, they have built-in exhaust ports rather than bolt-on adapters. Their practical rpm range is listed as 3,000 to 40,000! Can you imagine the sounds these things make at 40,000rpm?

The most interesting feature on these engines is a "special intake chamber," which, at first, had many of us at the office scratching our heads trying to figure it out. A piece of fuel line is connected to the crankcase at the base of the carb and loops around to the backplate, where it meets a nipple. O.S. says this line "neutralizes pressure pulse differences between high and low end for better transitional acceleration." I can't wait to see how well it works, and I've heard that it helps with fuel economy.

Their other features include: a crank that helps to produce more power; a lighter, more durable bushing material in the connecting



Futaba's plug-in fail safe unit.

rod; bearings with larger balls and rubber seals; polished intake ports for smoother airflow; and a piston with holes that improve cooling and acceleration. Like the RG, the RZ comes in on- (RZ-

versions. Horsepower ratings for the RZ are 2.3b.hp at 30,000rpm (off-road), 2.4b.hp at 32,000rpm (on-road).

* Addresses are listed alphabetically in the Index of Manufacturers on page 176. ■



O.S.'s new RZ-B engine is rated at 2.4 b.HP.

NITRO Q&A

I have an RC10GT with an O.S. CZ-R .12 engine, and I need some advice. I wanted to convert my engine to diesel with that Davis Diesel thing. Is that a good idea? Exactly how much more power would that give me? Also, is a tuned pipe a good investment? Some advice would be great!

ARMIN ZILERDI
Great Falls, VA

We have someone working on a review of the Davis Diesel head conversion right now. I talked to him about the system a couple of days ago, and here's what he had to say: the engine fires up very easily and requires only a little tweaking to get the idle right. Power is great, and he says it rivals his .21 buggies in speed. He says he gets about 24 minutes of run time on a tank—yes, 24! The only downside to the system is that the fuel is more expensive than glow fuel, so although run times are longer, you'll spend a little more for the diesel fuel than for glow. Other than that, he loves it and can't wait for Davis to come out with a head for his .21!

Got a question about gas?

Send your letters to Nitro Q&A,

R/C Car Action, 251 Danbury Rd., Wilton, CT 06897.



Painting Lexan with Automotive Paints



The Tamiya R/C Championship races are pretty interesting: you meet lots of people; nobody races too seriously; and the cars tend to be very realistic. There is lots of "oohing and aahing" over the many realistic Lexan creations. Even the car interiors are highly detailed, and you can

almost imagine the little driver figure turning the key and speeding off through the first turn!

At the second "home track" race held at Tamiya's* Southern California headquarters in October 1994, the Concours event was won by an immaculate D2 Mercedes-Benz DTM

sedan that was painted an unusual turquoise blue. The interior and even the wheels were painted in shades of complementary colors. Surely, I thought, this guy must be here just to show off his painting skills. Boy, was I surprised to see the Benz's owner—Jay Jamison—zipping around

the track (albeit carefully) in such a gorgeous vehicle. He won Best of Show in the Sedan Class that day, and I asked him how he managed to get such a neat color laid down. Here are some tips that I got from him that I'd like to share with you.

1 Jay uses only Pittsburgh Plate Glass Co. (PPG) products in his airbrush to paint his Lexan bodies, and he recommends them highly. If you use a different paint system or manufacturer, you may not get the same results, so you should probably start with the PPG stuff. Pay attention to the paint-system numbers in this guide, because many products have similar names but different numbers. Some of them will ruin your Lexan, or they will make the paint harden too quickly and chip off. You can get all the painting supplies you'll need at any first-class automotive paint supplier.

2 Start by rinsing out the body shell with water and drying it with a lint-free cloth. Then, wipe the body's interior down with PPG DX103 Multi-Prep. This cleans the surface and removes any silicone, grease, or other release agents left over from the molding process. Mask off the windows or other areas that you want to keep clear, but don't mask off the separate colors yet.

3 Use a gray 3M Scotch-Brite™ pad—no. 07448—to scuff the inside of the body. Don't use a red one, because it's too coarse for this application. You don't need to press down very hard; use very little hand pressure. This abrasion will give the paint something to grip onto when it's applied. Using Multi-Prep, again wipe out the interior with a lint-free cloth, and be

very careful to get into all of the corners and folds of the body. Examine it under a strong light, and work on getting it totally clean inside. Anything that you leave on the surface at this point will become part of your paint job! This is also a good time to cover the body's exterior with a thin plastic wrap (if it doesn't come shrink-wrapped from the factory). This will prevent it from being scratched, and will also protect the surface from paint overspray.

4 Use a tack cloth on the inside of the body to remove all of the teeny-tiny dust, grit and Lexan particles that you can't see until it's too late. Then, using medium air pressure, spray on two very light coats of PPG DPX801 Universal Plastics Primer. This has a setup time of 1 hour, so you'll need to let the body sit for at least 60 minutes before you touch the inside. On the other hand, you'll have to do all of your color painting within 24 hours of shooting the DPX801, because the primer is only good for that long. If you wait longer to shoot a color, you'll have to reapply the primer coat.

5 After the primer has dried, mask off the color separations just as you would for any other paint product. Start with the darker colors, and then apply the lighter colors so that the dark colors won't bleed through the light ones. Jay uses the PPG D.B.U. color paint series mixed in a 1:1 ratio with PPG DRR no. 1175 or no. 1185

reactive reducer. Use the reducer that corresponds to the temperature of your spraying area. Because DRR is a reactive reducer, and the reactive catalyst is in the clearcoat (which you don't apply), the paint stays relatively soft. If you were to apply the catalytic clearcoat, the paint would get too hard, and it would chip off if you whacked into a board or curb. Jay likes the D.B.U. color series because all of the colors can be mixed, including solids, pearls and metallics. Spray two to five light coats per color, depending on the color coverage and your preference. Remember, too much paint makes the body really heavy! When you've finished, use lacquer thinner to clean your airbrush.

6 These techniques should not be attempted by a first-time painter! You'll need to use the proper equipment, including an airbrush or automotive touch-up gun, a compressor and a respirator while you're spraying. This stuff sticks to everything it touches—including your lungs! Spray in a well-ventilated area, and get some general rules on spray safety from your automotive paint supplier. On the other hand, if you've already mastered the basics of using an airbrush, this could well be the way to come up with really wild paint colors and effects. Just ask Jay Jamison; he's got the trophy to prove it!

* Addresses are listed alphabetically in the Index of Manufacturers on page 176.



Tekin Formula 10

HERE'S SOMETHING new for racers!—Tekin's* latest electronic speed control (ESC). The Formula 10 is a solid, high-frequency, motor-drive controller at a very affordable price.

Its massive extruded-aluminum heat sink appears to be an integral part of the unit, not just a press-on affair, but at first I was puzzled about the FETs: where were they?—lying flat and bonded directly onto the heat sink. This allows incredibly good FET cooling.

Much of the circuitry is contained in a single, 28-pin, Tekin-designed computer chip—one of the reasons for the unit's bargain price. Hats off to Tekin for one cleverly designed ESC.

TESTIN' THE TEKIN TEST 1—RESISTANCE

Resistance is an ESC's most important feature. We operate our R/C cars on a relatively low voltage (typically 7.2 volts), so it takes a huge amount of current to get the screaming performance that we racers crave. Because of this, the slightest resistance will waste way too much power.

With 12 amps of current flowing, I measure the voltage drop across the ESC and then calculate its "on" resistance by dividing the measured voltage drop by 12. I measure resistance twice—along the full length of the motor wires and battery wires (including connectors) and 2 inches along them. The first reading helps me to determine an ESC's resistance as it comes from the factory, and the second gives a standard reading with which I compare ESCs.

- Voltage drop along the full length of the battery wires and motor wires (including connectors): 0.24 volt—a resistance of 0.020 ohm.

- Voltage drop 2 inches along the battery wires and motor wires: 0.07 volt—a resistance of 0.0058 ohm.

These readings are interesting, because the first one is close to 3.5 times higher than the second one. As I have written many times, long wires and Tamiya-style connectors will kill the performance of any good ESC. I

checked my ESC comparisons and found that all of those with similar resistance readings had a *considerably higher* price tag. Admittedly, the Formula 10's resistance readings aren't world-class-low, pro-level figures, but they're respectable enough to provide great performance.

TEST 2—OVERHEATING

I "cook" every controller I test by adjusting the resistor bank to pass 20 amps of current, jamming the throttle wide open and running the ESC for 15 minutes while it pumps a hefty 20 amps.

At this current level, most standard battery packs will dump in 4 minutes, but the point of this test is to push a controller to the wall and see whether it remains operational. Of course, the Formula 10 has an integral heat sink, but I didn't give it any air cooling. After 15 minutes of this abuse, the heat sink was too hot to touch comfortably, but the controller was still operating normally. I'm sure that the usual cooling provided by the movement of an R/C

car would keep the Formula 10 running cool, and it should, as Tekin claims, be able to handle hot modified motors.

A FORMULA FOR FUN?

I probably hold the world record for installing ESCs, but even so, I still read the Formula 10's 16-page manual from cover to cover before I was ready to install it in my MRC MT-10S truck. Because it comes with a complete set of connectors and its base is flat, this ESC is a snap to install and secure with servo tape.

The accessory kit contains the plastic shell required to convert the Formula 10's receiver plug to fit just about any receiver. Changing the receiver plug is a little tricky, but the manual covers the procedure in detail (it even has pictures for those of us who refuse to read).

Because of all the bells and whistles on today's transmitters, it can be difficult to find the optimum settings for the controls, so I was glad to see that the manual also contains a transmitter adjustment chart. My

WHAT IT HAS

- Forward-only with brakes.
- Massive built-in heat sink to which the FETs are bonded.
- Three low-resistance FETs (two for forward, one for brakes).
- High-frequency motor drive.
- Reverse-voltage protection.
- Factory-installed battery, motor and receiver connectors.
- Neutral and full-speed adjustment pots.
- Pulse-checking LED.
- Battery-eliminator circuitry.

Of course, it has decals, an instruction sheet, motor capacitors, mounting tape, adjustment-hole plugs and an adjustment screwdriver.



only problem arose when I set the neutral and full-speed adjustment potentiometers (pots). Tekin provides a plastic screw-

driver to do this job, but the full-speed pot wasn't aligned with the hole in the heat sink. The screwdriver fit snugly through the hole in the heat sink, but it wouldn't engage the slot in the pot. I used a jeweler's screwdriver to make the necessary adjustments.

I made the first run on the enormous parking lot in front of my apartment. This is a high-frequency controller, so silky smooth throttle response and cooler, longer running motors were sure bets. Acceleration was strong, top speeds were screaming, and brakes were very strong yet controllable. One-hundred-and-eighty-degree sliding turns were crisp and exciting to watch. I ran my MT-10S truck to the end of the parking lot to check for glitching—no sign of any glitches, even at the far end of the parking lot.

After the first run, the heat sink was barely warm. The massive heat sink and the air cooling provided by high-speed running keep the Formula 10 really cool.

Loaded with a fresh battery pack, I let my MT-10S truck run in front of me (like walking the

dog?) to the volleyball court. The Formula 10's HF motor control is so silky smooth (especially at the lower speeds) that "walking the dog" was easy.

The court offers a choice of sand and grass, and on an adjacent golf-putting green, there's carpet. Between this variety of surfaces there are challenging humpty bumps. It's a great test track: you can scream across the carpet, become airborne off the humpty bump at the edge of the putting green and then plow into the sandpit and watch the sand fly.

An R/C truck is like a magnet for young people; in no time, I had several young volunteers to help me test the Formula 10. I explained that this wasn't play, but a rigorous testing session. They took the task seriously and proceeded to run the wheels off my MRC MT-10S. Running on grass and sand places a real strain on a motor, and I usually try to avoid them, because I don't enjoy replacing burnt-out motors. But this was all part of the test, so....

Whenever the battery pack dumped, I checked it, the ESC and the motor

for overheating. The battery was very warm, and the motor was so hot that it could have burnt skin, but the Formula 10 was only slightly warm. The motor barely survived this abuse, but the controller was obviously more than ready for my young test-drivers.

BEST FEATURES

- It's affordable!
- It's high frequency. When running at partial throttle, the Formula 10 is switching the power on and off at a 2500Hz rate rather than at the usual 60Hz rate. This promotes longer run times, cooler motor running and incredibly smooth throttle response.
- It has a well-designed heat sink that's bonded to the FETs and also acts as a lid to the case.

During the driving test, acceleration was strong and top speeds were truly spectacular. All this combined with its small size makes the Formula 10 well-suited to most racing programs, but its best feature may well be its price. It's a lot of ESC for the dollar.

**Addresses are listed alphabetically in the Index of Manufacturers on page 176. ■*

SPECIFICATIONS

DIMENSIONS

Height.....0.91 in.
Width.....1.43 in.
Length.....1.82 in.

WEIGHT

(w/wires and heat sink).....2.2 oz.

TUNING

Access to controls.....Good
Ease of adjustment.....Fair

LIST PRICE/WARRANTY

..\$95/120 days

ELECTRICAL (manufacturer's specs.)

Max. voltage.....8 cells
Min. voltage.....4 cells
Rated current.....Not listed
Resistance.....0.0034 ohm

TEST PARAMETERS

Voltage.....6 volts
Current.....12 amps
• Voltage drop
—along full length of wires.....0.24 volt
—2 inches along wires.....0.07 volt

• Calculated resistance*

—along full length of wires.....0.02 ohm
—2 inches along wires.....0.0058 ohm

BEC output, 6-cell battery.....5.70 volts

*Resistance = voltage drop ÷ current

COMMENTS: surprisingly small, surprisingly light, surprisingly strong, no-frills budget-price with high-frequency motor control. Great heat sink! Can handle modified motors.

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#6500 - \$650.00

HOLESHOT RACING PRODUCTS

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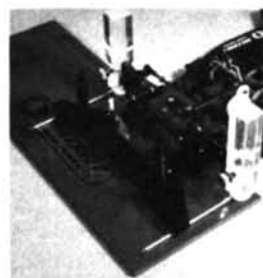
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Set up and balance your car for every track you race.

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GETTING STARTED

by Brian Leslie

Keep that motor runnin'

ELECTRIC-POWERED R/C CARS and trucks couldn't be easier to build, maintain and run. Just charge up the battery, and turn on the switch. By and large, the electric motor is the only component that needs a bit of maintenance—not much, but a bit. Unfortunately for most beginners, knowing when and how much maintenance is required is less than common knowledge. In this month's column, the subject is motors, and the name of the game is keeping 'em running.

WHEN DOES A MOTOR NEED WORK?

Despite what you might have heard, you don't need to clean your motor after every run, unless you run in a very sandy or dusty area. But do get into the habit of inspecting the motor after each run.

Here's how:

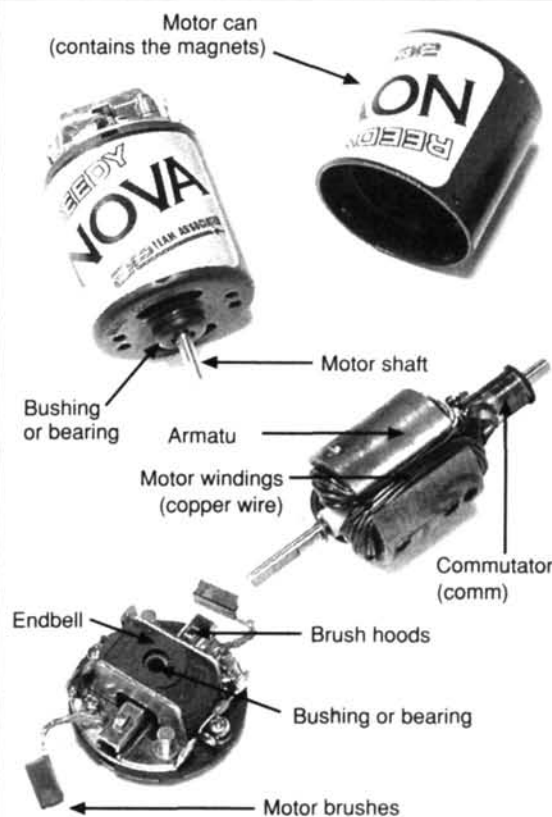
- Look at the commutator/brush area, as this area is most likely to show signs of wear. First, look at the

area of the comm that isn't in contact with the brushes. This area, which is easily viewed through the endbell opening, should be a nice, copper color. An orange hue (or worse, a purple hue) means that the motor has overheated and needs immediate attention, or it's curtains!

- Next, remove the motor's brushes from the brush hoods for a closer inspection. Do this by first removing the brush springs, then carefully sliding each brush out of its hood. If you suspect that you may have overheated the motor, consider replacing the brush springs, because excessive heat tends to make them lose their tension.

What's the prognosis, doctor? Healthy brushes are usually a coppery-chocolate color. A purplish discoloration on the brush where it contacts the comm means arcing (a spark generated when the

PARTS you should know



brushes bounce off the comm when the motor runs) and overheating—a condition that only gets worse with continued use. Brushes should also be replaced if they are worn down to less than 5/8 of their original length.

- After the brushes have been removed, a closer inspection of the comm can be made. Some small burn marks between the comm segments are nor-

mal, but severely burned, pitted and discolored areas mean it's time for a rebuild.

WHAT IF MY MOTOR IS OK?

If you inspect your motor and everything looks hunky-dory, keep on runnin', but I do recommend the following. Allow the motor to cool between runs. In other words, don't just pop in a fresh battery and go right out;



Inspecting the motor brushes and the commutator will tell you whether the motor is in need of aid. Remove the brush springs and carefully slide the brushes out of their hoods to check their condition and that of the comm.

My new off-road truck came with shock pistons with holes in them. What is the difference between pistons?

Shock pistons control the speed of the shock damping and rebound. The smaller the holes in the piston, the more slowly the shock will be compressed and rebound. Smaller-holed piston valves are used on smooth tracks or tracks with rolling bumps. Larger-holed pistons are good for rough, stutter-bump-type conditions in which the wheels need to move up and down quickly to retain traction.

When I use Ni-Cd batteries in my radio, the voltage meter only goes to 80 percent. Why?

Ni-Cd batteries have a slightly lower voltage level than alkaline batteries do. The voltage level of the average Ni-Cd battery is 1.2 volts DC. The voltage level of an alkaline battery is 1.5 volts DC. So, $8 \times 1.5 = 12$. This is 100-percent power for your transmitter. Ni-Cds on the other hand, will deliver 8×1.2 , which equals 9.6, which is 80 percent of 12. This is why your meter only reads 80 percent.

Why does using a larger pinion gear make a car faster?

Pinion gear size affects how fast the tires spin in relation to how fast the motor spins. A larger pinion makes the tires spin faster in relation to the motor. But you must be careful not to "over-gear" the motor. The lower the final drive ratio, the harder it will be for the motor to turn the rear wheels. This means run times will be shorter, and motors will run hotter—not the best thing for your motor.



GETTING STARTED

you're asking for overheating problems. Of course, you'd be wise to perform a visual inspection after each run to check for signs of wear.

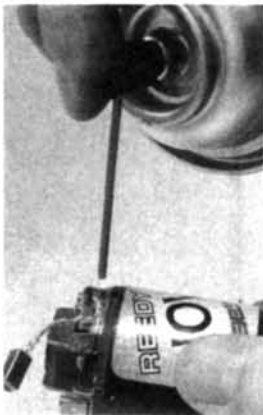
CLEANING A MOTOR THAT'S IN GOOD SHAPE

Even if it doesn't show signs of wear, clean your motor after every three or four runs. Some people will tell you that it's OK to clean a motor while it's in the car. Don't do it! Shooting motor spray into a mounted motor flushes all of the dirt into the bushings or bearings and removes vital lubricants. Also, some sprays may attack your car's plastic pieces. Do yourself a favor, and take a few extra minutes to remove the motor so you can clean it properly and re-lube the bushings or bearings.

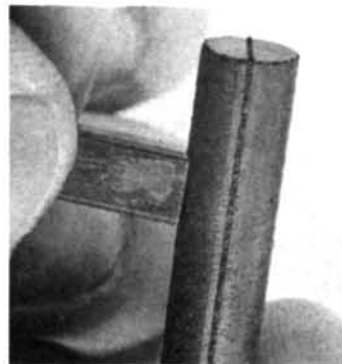
- First, with the motor out of the vehicle, remove the brush springs and slide the brushes out of their hoods. While holding the motor

horizontal, give the comm a short burst of motor spray. The object here is to keep the spray from getting on the bushings or bearings.

- Slide the rectangular end of a low-abrasion comm stick (available at hobby shops) through



Use motor spray sparingly to clean carbon buildup and dirt out of the motor. To prevent the dirt from being flushed into the bearings or bushings, hold the motor in a horizontal position.



The round end of the comm-cleaning stick is used to clean the faces of the motor brushes. For the best results, gently rotate the stick (in the direction in which the motor spins) against the brush face.

one of the brush hoods until it touches the comm's surface. Apply gentle pressure to the stick, and spin the motor. Next, lightly roll the round end of the stick against the face of each brush. Be sure to rotate the comm stick in the direction in which the motor spins. Remove any sharp edges from the brushes using the comm stick or a small nail file.

- Place a small drop of light oil on each bushing or bearing, and re-install the brushes. I like to place a few drops of Aero-Car's* Conducta motor brush lube on the face of each brush before I install them.

Most hobby shops offer a comm-cutting service for a nominal fee. Some shops even have lathes that can cut the comm on a stock motor.

Ideally, try to have your comm "skimmed" (cut) about once every 12 runs. If this is unreasonable given your circumstances, you can go longer between cuts, but the amount of comm material removed during the cut will be larger because the comm will be more worn.

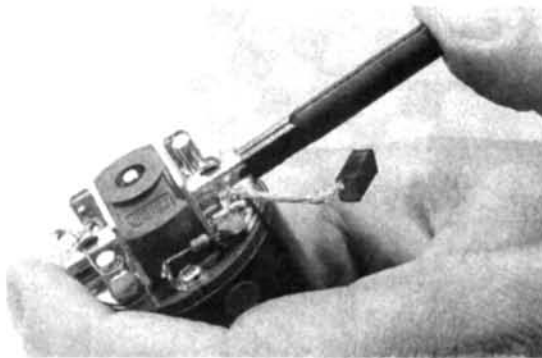
Of course, any time the comm is cut, you should install new brushes. As a rule, the more frequently the comm is cut, the longer the motor's overall useful operating life will be. The damage done by arcing and overheating tends to "snowball" if left unfixed.

Properly maintained, your motor will provide you with hours of good performance. The key to longevity lies in knowing how to detect the early signs of wear, then knowing what to do about it.

* Addresses are listed alphabetically in the Index of Manufacturers on page 176. ■

WHAT IF IT NEEDS A REBUILD?

If the comm has worn, don't bother to change brushes; you're just delaying the inevitable. The only way to return your motor to like-new performance is to have its comm cut on a comm lathe. Now, before you say, "Oh, great! I have to buy a \$150 comm lathe to enjoy my hobby," just hold on a minute.



A comm-cleaning stick helps to remove the crud on the comm that the motor spray doesn't get. When using a comm stick, only the slightest pressure is required to hold it against the comm; too much pressure can distort the comm.

Why can't I use a speed control with reverse for racing?

The first reason is that a brake is more important and useful than reverse for racing. The second reason is that if everyone had reverse, crashed cars would be backing up into oncoming cars, and that would create some horrific accidents.

I have an Associated* LSO on-road car. I have noticed that some ads for pinion gears show a picture of the gear. Some

of the gears are really thin. How come?

The biggest reason for loss of speed and short run times is friction. When the pinion and spur gears are thin, there is less friction between them, and that means there is less power loss between the motor and rear tires.

I have heard some people talk about reversing their Ni-Cd batteries. Is this possible?

Yes, it is very possible. When discharging a

Ni-Cd battery, it is important not to short out the battery or bring its voltage level too far below 1 volt or so. Some people will short out the batteries or place a resistor across the leads and then leave them that way. Do not do this. The best way to discharge a battery pack is to place a 1.2V light bulb across the leads of the pack. This will guarantee that the battery voltage will never drop to dangerous levels and, when the light bulb goes out, you'll know the battery pack is drained and ready for recharging.



Seven pounds of off-road FUN



SPECIFICATIONS

SCALE 1/8
LIST PRICE \$499

DIMENSIONS

Length (overall) 18.9 in.
Wheelbase 13 in.
Width (F/R) 11.75 in.
Height 7 in.
Clearance 1.9 in.

WEIGHT (gross, RTR) 7 lb. 4 oz.

CHASSIS

Type Pan (with nylon chassis side guards)
Material Anodized-aluminum

DRIVE TRAIN

Type Gear/shaft
Primary Clutch/pinion/spur
Transmission Gear
Differentials (F/C/R) Planetary
Bearings/bushings Full bearings

SUSPENSION (F/R)

Type 4-wheel, independent, double-wishbone with front and rear anti-roll bars
Damping Aluminum oil-filled, coil-over shocks with rubber dust guards

WHEELS (F/R)

Type One-piece plastic
Dimensions (DxW) 3 x 1.75 in.

TIRES (F/R) Pneumatic rubber, small racing pin

ENGINE

Type Super Force P6 .21 (not included)
Pipe OFNA stock tuned-pipe exhaust
Carb Super Force stock (not included)

Things You'll Need

- A .21 rear exhaust engine.
- Reliable 2-channel radio system (including receiver and one quick but strong steering servo and one throttle servo).
- Ni-Cd receiver battery pack.
- Fuel.
- 1.2V glow-plug igniter.
- Hand-held starter or starter box (if engine isn't pull-start).
- Paints (for Lexan body).

FACTORY OPTIONS

- Hard-coated shocks—part nos. 32201 (front); 32202 (rear)
- Graphite front brace—no. 31270
- Graphite radio plate—no. 31280
- 2-speed tranny—no. 35001
- Various gears
- Various aluminum hop-ups

by Jonathan
Biebesheimer

OFNA Ultra-GT

newest creation—the 1/8-scale Ultra-GT. This 4WD, gas-powered, off-road buggy was designed with your off-road quest in mind!

KIT FEATURES

From the bottom up, the Ultra-GT offers an impressive list of features. The car is built on a brilliant-blue, anodized-aluminum chassis with countersunk screw holes that give it a smooth bottom. For protection, there are molded-nylon chassis side guards, and for extra support, there are aluminum stiffeners for both the front and rear of the car. A separate radio tray made of the same aluminum material as the chassis provides easy removal of the electronics for cleaning. A good-size, plastic front bumper and strong rear-wing supports round out the car's "durable parts" list.

The drive train consists of three diffs—front, rear and center. All three are planetary and almost identical. The front and rear gearboxes allow easy access to the differentials for easy maintenance. A .21 engine provides the power, and a dual-disk

braking system on the center-diff assembly keeps the car under control and stops it on a dime! A tuned pipe and an engine manifold are "standard issue."

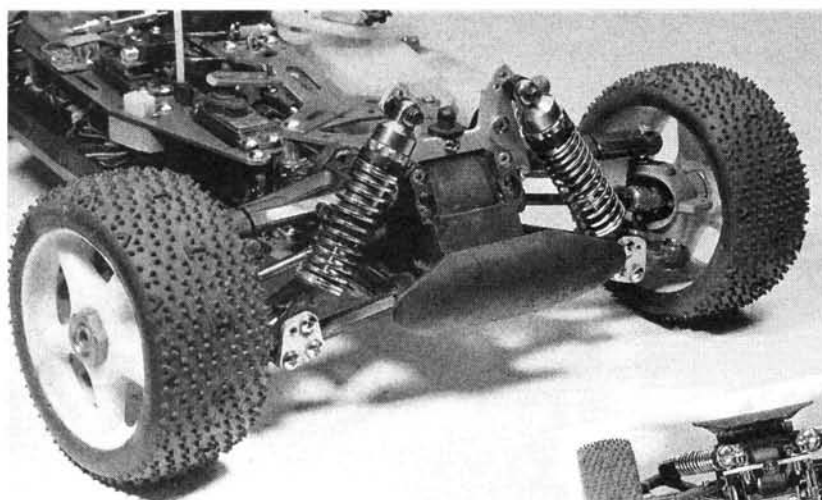
To ensure the smoothest ride possible, OFNA packs a full bearing set with the Ultra-GT (18 in all!). The oil-filled shocks that come standard with the kit are also first-rate. They're all-aluminum with hefty, square wire springs and protective rubber dust guards. With the fully adjustable front and rear suspension arms (upper and lower A-arms in the front, lower A-arm with upper link in the rear) and front and rear anti-roll bars, you can bet the Ultra-GT can be tuned for one wicked ride!

TEST GEAR

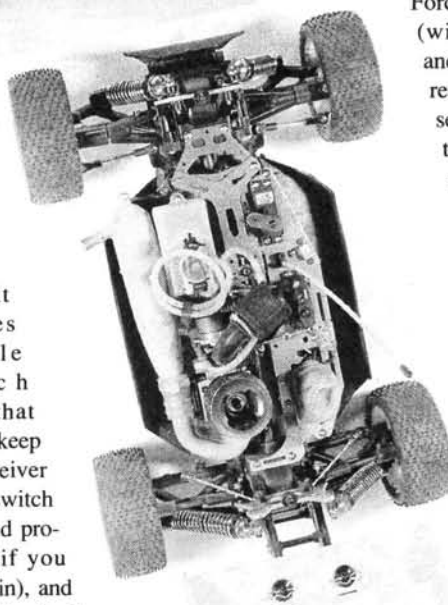
The Ultra-GT doesn't come with the .21 engine, so you'll have to pick one up. But it does come complete with a clutch assembly that will work on almost any engine. If you install an engine with an on-road crankshaft, you'll need to buy a few special parts. For my Ultra-GT, I got hold of a Super Force* P6 (E2103), which came with a great custom

Dirt.
Rocks.
Mud. Sand.

With these ingredients, you can almost guarantee yourself a great day of racing! But to defeat the cruel world of 1/8-scale off-road, you'll need to equip yourself with a suitable weapon, and finding one is not an easy job. The sea of off-road vehicles available today can be downright overwhelming! But before you give up hope, take a peek at OFNA's*



The front shocks on the Ultra are blue anodized and feature an external rubber boot seal. Notice the beefy, metal hub carriers up front with the universal drive shafts.



The Ultra's chassis layout is straightforward and easy to maintain. To make cleaning easier, the radio tray on the right side of the chassis can be removed. Also note the stone guards on either side of the chassis.

head (a cool color, too!) My radio gear included things that I liked and knew I'd be able to rely on when it was time to pound the car into the ground! For the steering servo, I used a JR* NES-4735, which is lightning-fast and very strong. I had an Airtronics* 94102 servo (which, though inexpensive, had worked well on previous cars) that I used as my throttle servo, and for the radio system, I used a Futaba FP-R113IP receiver and

The kit includes a little switch cover that helps to keep your receiver battery switch clean and protected (if you put one in), and I also attached an SCI* receiver battery pack indicator light that shows how much life is left in the pack.

PERFORMANCE

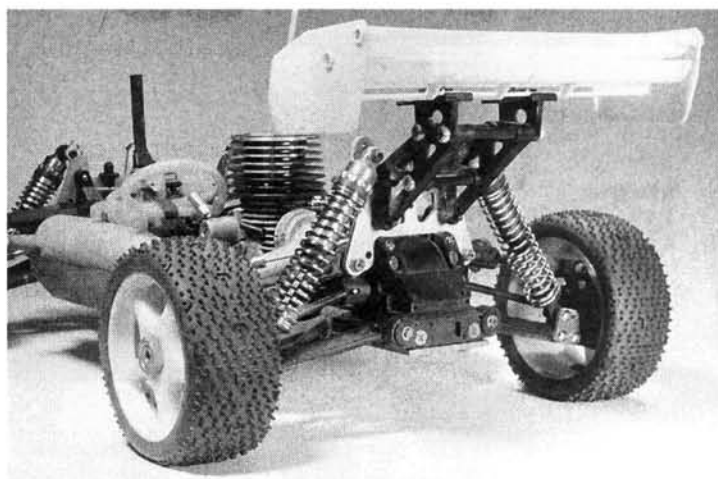
There's no doubt about it. When it's finished, the Ultra-GT looks pretty impressive with all its features and killer parts. But unfortunately, looks won't do much for you

when it's time to race, so I was very eager to put the Ultra-GT to the test! With my gear charged up and a gallon of fuel, I went in search of a spot. I found a huge building development near my house that was full of all the things that make a car shudder—dirt, rocks and plenty of dust. My car went from brilliant blue, yellow and magenta to light brown in about 60 seconds flat!

Because the engine was new, I broke it in slowly with a couple of tanks. I was impressed at how quickly and easily the Force engine turned over. It wasn't long (with the help of a few minor high- and low-end tweaks) before the engine really began to purr and kick in some serious power. The Ultra-GT had good top speeds and was very quick to respond to a "let it rip" trigger squeeze!

The rugged terrain really let the car show off. The instructions recommend that you start with the 40WT oil that is provided with

the kit. But the oil had spilled and made a mess of the parts! I use Team Losi's* Silatech oil on my cars. For the Ultra-GT, I started with the Silatech 350 (clear 30WT), which wasn't quite thick enough. But although the car "whooped" up and down a bit, I must admit that I was very impressed with its handling. At nearly top speed, I was thrilled to find that I could maintain control over a long straightaway of big-time ruts and bumps.



The rear suspension features adjusters that can alter toe-in/out by rotating the plastic suspension pin holders. Also note the sturdy wing mount and tri-level plastic wing.

likes

- Top-quality parts.
- Great attention to design and features makes the car extremely competitive.
- It sure is a durable machine!
- A time-consuming but fun assembly.
- Very easy to make full adjustments (toe-in, toe-out, camber, wing height and angle, ride height, etc.).
- Removable radio tray for easy access and maintenance.

dislikes

- The kit's instructions and packaging are a little chaotic.
- The included steering-servo linkage isn't long enough to adjust to all servos (at least, not to the JR NES-4735!).

Futaba PCM 1024 (FP-T3PB) transmitter. I also stole a Dynamite* Power Pack from one of my other cars for my receiver batteries. I particularly like the Power Pack because of its size; it fits great underneath the radio plate just next to the engine.

The Ultra-GT is the ultimate car for the serious builder. Nothing has been preassembled, and that makes for a lot of fun if you're into construction! The instructions for the "build-fest" are very thorough, although I found them more difficult to decipher than others. Also, the parts are sorted in a somewhat peculiar fashion. Before starting construction, it definitely helped to go through the entire instructions and to sort all the parts according to building sequence. By doing this, I was certain to use the correct parts in the correct places. This also draws attention to a couple of "assembly corrections." (The few, last-minute "Oops, we gotta fix that before we ship it"-type things!) When it's well-organized, the construction is fairly easy and quick. But here are some difficulties to watch out for.

- One of the "assembly corrections" is the insertion of rubber O-rings in the diff case. The O-rings and tiny instructions come in a separate little bag. Be sure to do this step *before* doing the steps in the main instructions. Also, to ensure that the diffs work properly, make sure that the sun gears face the

correct way in each diff.

- When installing the lower brake lever in the center diff assembly, make sure that the screws that hold the spur gear don't hit the brake lever. Also, check the screws when building the gearboxes, because the screws that hold the bevel gears onto the front and rear diff assemblies hit the inside of the gearbox cases. To allow the diffs to spin freely, I used a Dremel tool to shave off a little bit of the case where the screws were hitting.

- Use Loctite* on all the metal screws that go into metal parts (there are many, including a couple that the instructions don't really point out). This will prevent the screws and nuts from vibrating loose when you're pounding it off-road! By the way, using Loctite (or any other brand of thread-locker) is mentioned in the instructions, but the poor English translation makes it a little difficult to figure out.

- The three-shoe clutch does not use a single spring to hold the shoes closed. Instead, three small individual clutch springs are used. Be careful not to throw these away when sorting parts! When I dumped out the parts

bag they were in, I almost launched mine into the trash!

- When installing the side muffler pipe, install the fuel tank *first* (reversing the order that the instructions suggest). This makes it a little easier to figure out how the muffler stay has to be bent to support the pipe and prevent it from touching and melting the fuel tank.

- Before bending the muffler stay, make sure the hole in the muffler that the stay fits into is as shown in the instructions. Mine was not, and I had to bend the stay completely differently. Also, install at least the left molded stone guard before you tighten the nut that holds the muffler stay on the chassis.

- Depending on what brand of engine you buy (and whether the carb has a throttle ball), you might need to build the throttle linkage without the throttle joint (as I did). If so, the instructions include a picture of the alternate assembly.

- Don't forget to install the antenna post before you install the radio tray. (OK; I admit that I forgot to do this—a rookie mistake!)

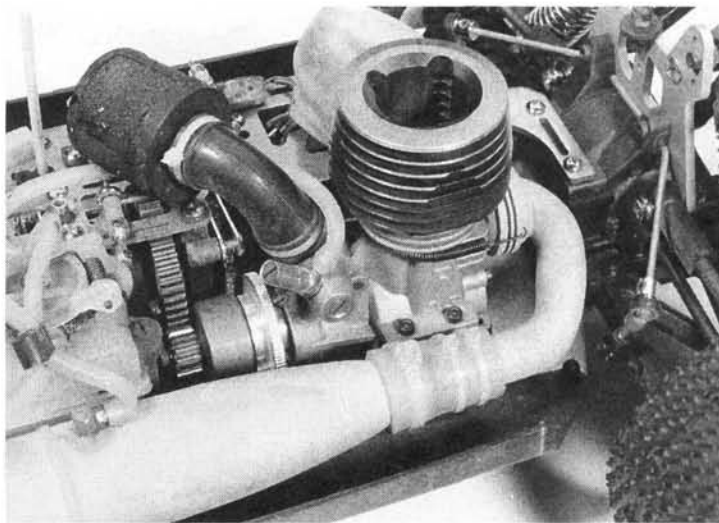
The smooth suspension also allowed tight, accurate turning—a plus when you're heading directly toward a ditch!

My car's setup seemed to be a little better suited to slightly less radical terrain. The next day, I spent a bit of time racing at a local baseball field. The 4WD helped the Ultra-GT really dig into the grass for some great, speedy rides. And after hitting the raised pitcher's mound, I got a taste of what I've heard everyone say about 1/8-scale buggies. They can really get airborne!

FINAL THOUGHTS

This sport never ceases to amaze me. Just when I think I've seen it all, along comes another contender that blows me away. With the Ultra-GT, OFNA accomplishes

The Super Force engine runs well and puts out plenty of power. The kit includes a good-quality air filter, header and tuned pipe.



The Competition

	OFNA ULTRA-GT	MUGEN ATHLETE	FLYING POINT JET PROBE	KYOSHO TURBO INFERNO
Wheelbase	13 in.	12.7 in.	12.75 in.	12.9 in.
Width	11.75 in.	12 in.	11.75 in.	11.9 in.
Weight	7 lb., 4 oz.	7 lb., 6 oz.	7 lb., 8.5 oz.	7 lb., 6.4 oz.
Diff type	Planetary	Planetary	Planetary	Bevel
Brakes	Dual disk	Dual disk	Dual disk	Dual disk
Exhaust	Tuned pipe	Not included	Header and pipe	Not included
List price	\$499	\$649.99	\$595	\$679.95
Available for*	\$299	\$439.99	\$369.99	\$499.99
Issue reviewed	11/95	9/94	1/95	9/94

*Prices may vary with location.

many goals. For anyone who is looking to get into 1/8-scale off-road, it guarantees a good time. For the more experienced driver, the hot features make the car extremely competitive and good for radical driving! And for the builder, the kit comes in a zillion pieces—the makings of a fun assembly. Put all of these things together, and I say you've got a winner! So, as you're preparing for the great outdoors, be sure to check out the Ultra-GT. You know the expression, "Don't leave home without it!"

* Addresses are listed alphabetically in the Index of Manufacturers on page 176.



TAMIYA Isuzu Amigo

by George Gonzalez

Mysterious Utility

AFTER TAKING a close look at Tamiya's* new Isuzu Amigo, I'm convinced that its designers at the new Tamiya America facility were influenced by recent California automotive trends. With low-profile tires, tinted windows and plenty of chrome accents to shine in the California sun, the only thing this 4WD sport-utility vehicle is missing is a 500W stereo system

with a pair of 15-inch sub-woofers!

The Amigo has the same chassis and drive train as Tamiya's other 4WD sport-utility vehicles—the Mitsubishi Pajero and Jeep Wrangler, but its lower-profile set of tires makes it more of a pavement burner than a backyard basher. In other words, if this were a full-size Amigo, it would be seen cruising down Santa Monica Boulevard or the Pacific Coast Highway rather than blazing through fire breaks in the Angeles Crest Mountains.

KIT FEATURES

The Amigo has a tough, ABS plastic-tub-style chassis with molded wheel wells and a built-in tranny case with an access hatch. There's plenty of room on the chassis for your electronics, and the built-in battery compartment keeps the battery pack nice and snug. A centrally mounted 540 motor transfers power to the front wheels by means of outdrives in the front differential and short, chrome-plated dogbones. An extra-beefy, universal-joint drive shaft powers the rear wheels and connects the centrally mounted transfer case and the rear differential.

The front suspension consists of fixed, upper control links and lower A-arms. Molded, oil-filled, coil-over shocks equipped with soft, red tuned springs keep the Amigo on the right track. The rear sus-



specifications

SCALE 1/10
LIST PRICE \$279

DIMENSIONS

Length (overall) 17 in.
Wheelbase 9.75 in.
Width (F/R) 7.5 in.

WEIGHT (gross, RTR) 3 lb., 12 oz.

CHASSIS

Type Molded tub
Material High-impact plastic

DRIVE TRAIN

Type Gear
Primary Pinion/spur
Transmission Gear
Differential(s) Bevel gear
Slipper clutch None
Bearings/bushings Metal and plastic bushings

SUSPENSION

Front Lower A-arm, fixed upper arm
Rear Live-axle with upper and lower trailing arms
Damping Molded, oil-filled, coil-over shocks

WHEELS (F/R)

Type One-piece, chrome-plated plastic
Dimensions (DxW) 2x1.25 in.

TIRES (F/R) Low-profile, rubber street tires

ELECTRICS

Motor Stock 540 (included)
Battery Not included
Speed control 3-speed mechanical (included)

pension (probably the Amigo's most interesting feature) consists of a live-axle rear end supported by upper and lower trailing arms and an additional set of coil-over shocks (also equipped with soft, red tuned springs). Inside the axle housing is an extremely smooth bevel-gear differential with metal gears and a metal diff housing. Overall, the rear end is extremely realistic and works very well.

The cool-looking chrome-plated wheels and low-profile, rubber street tires with foam inserts are extremely realistic and perform exceptionally well on asphalt and cement.

The Amigo's meticulously detailed, polystyrene body is of static model quality, and looks as good on display as it does during a 4WD controlled power slide. The chrome-plated front and rear bumpers, wheels and side mirrors give the Amigo that concours-winning look, and there's even a spare tire mounted on the tailgate. A small but adequate decal sheet with all the necessary logos, taillights and window



moldings is included. To make the front headlights functional, just install Tamiya's optional light-bulb set.

TEST GEAR

I decided to install a new Airtronics* Rival 2P radio system in the Amigo. A pair of heavy-duty, standard servos (part no. 94102) and a 75-band, 2-channel AM receiver fit nicely on the chassis. I added a Trinity* Ex-Tech 1400 SCR stick pack and decided to first test the Amigo with the kit-supplied motor and mechanical speed control (why not, they're included).

PERFORMANCE

When I charged up the battery pack and hit the streets, I was a little concerned that the Amigo might be so top-heavy that it would end up on its lid on every corner, but I was wrong. The Amigo was extremely sure-footed and surprisingly agile. The

low-profile street tires hooked up nicely, and the soft suspension allowed the body to roll and sway just like a full-size Amigo.

The mechanical speed control, however, was a bit "sticky," and it was a little awkward having no brakes (just reverse). Don't get me wrong; having reverse is great, but if I had to choose one or the other, I'd choose brakes every time. The Amigo had decent get-up-and-go, but the top speed just wasn't there. Good thing my neighbor's dog wasn't around, because he would have had no problem

Building and Setup Tips

Building the Amigo is simple and enjoyable. The instructions are concise and easy to follow, and the large illustrations are perfect in every detail. The Amigo is suitable for builders of all skill levels, but more experienced builders could have the Amigo up and running in fewer than 4 hours (not including the body).

Here are some basic tips:

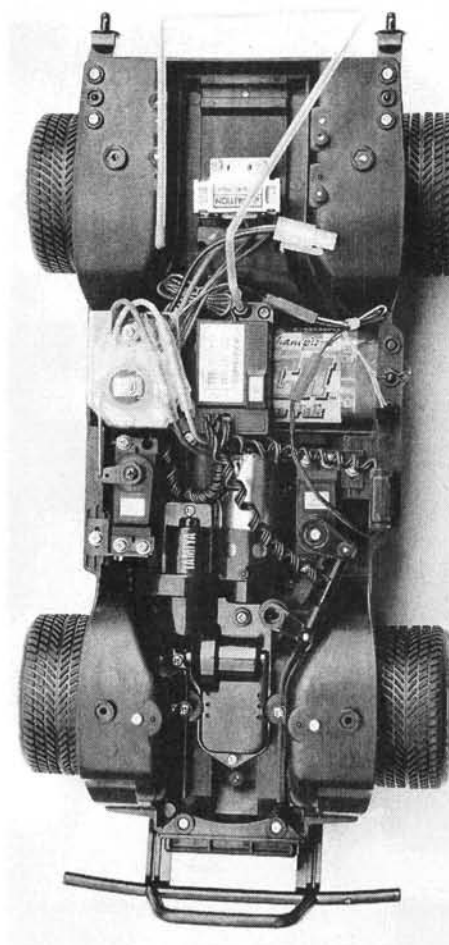
- Read the instructions thoroughly and, prior to building, familiarize yourself with the major kit components.
- Use a liberal amount of grease on all the transmission components.
- Although liquid thread-lock isn't called for in the instructions, use some on the grub screws that secure the drive shaft to the U-joints, and grease the U-joints. MIP* CVD lube works very well, but the kit-supplied grease is better than nothing.
- Don't forget to install the shock limiters on each shock shaft inside the shock body; these give the truck its low stance and tight handling. I used extra shock limiters for even better handling. Associated*, Losi* and Traxxas* shock limiters work well and are readily available.

Painting the Amigo

Painting the Amigo's polystyrene body takes a little more patience than painting the more common Lexan bodies, but the result is well worth the effort. I painted my Amigo using Testors' paint, which is suitable for polystyrene.

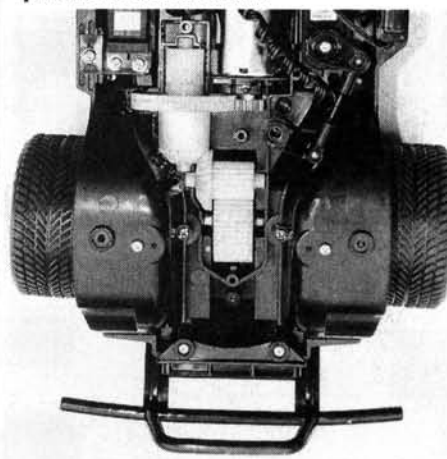
First, I sprayed on a couple of coats of flat gray primer and, to ensure maximum smoothness, I sanded the body with 600-grit sandpaper before each coat. Then I sprayed the body and rear cowl with eight coats of sapphire-blue metal-flake, allowing about 3 hours of drying time between each coat. I let the body and rear cowl dry for 2 weeks before I masked them off for the next color. This drying time is important because without it, you'll strip the paint when you remove the masking tape.

Next, I masked off the rear cowl and sprayed three coats of glossy black on the rear-deck lid. I painted the spare-tire cover at the same time. Then I masked off the body and applied three coats of glossy black below the front bumper. I let it dry for two days, then I removed all the masking tape and gave the body, rear cowl and spare-tire cover three coats of glossy clearcoat. I know this sounds like a lot of work, but all the compliments I received on this fantastic-looking vehicle made it worth it.



Although it isn't a hard-core racing machine, you'll probably enjoy bashing around your neighborhood with the Amigo more than with any full-blown racing truck.

Left: the Amigo has the same chassis as Tamiya's Jeep (May '95) and Pajero (Dec. '94). Below: when the gear cover has been removed, you can see the front-end gears. Unfortunately, there are only two pinions to choose from.



catching the Amigo and chewing off one of its tires.

Unfortunately, the Amigo's motor mount only accommodates a 16- or 20-tooth pinion gear. The kit includes the 20-tooth pinion gear, which gives it the highest possible final gear ratio, but with the stock 540 motor, it wasn't high enough to reach any decent speeds.

In the spirit of the great comedian Tim Allen, I decided to give the Amigo a dose of some heavy horsepower (oooh, oooh, oooh). Out went the mechanical speed con-

trol, and in went a powerful Tekin* TSC 610-G ESC. Out went the stock 540 motor, and in went a potent, Maxtec* EPIC-based 24-degree competition stock motor. I also added a complete set of Pro-Line* Road Hawks for maximum traction satisfaction. The Amigo was then ready for some serious road racing.

I wasn't a bit surprised when all four tires lit up, and the Amigo launched down my driveway (the smile was starting to crack). It ripped down the street with serious motivation (where's that mutt?). I was

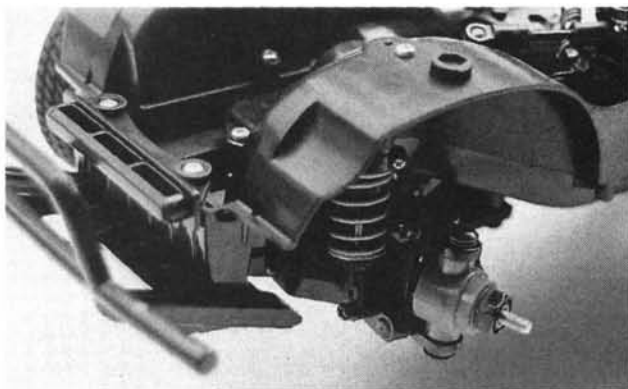
LIKES

- Stunning, realistic looks.
- Surprisingly good handling.
- Soft, red tuned springs are included.
- Motor and speed control are included.
- Cool-looking, low-profile tires with foam inserts.
- High-quality materials ensure the truck's longevity.
- Excellent instruction booklet (as usual for Tamiya).

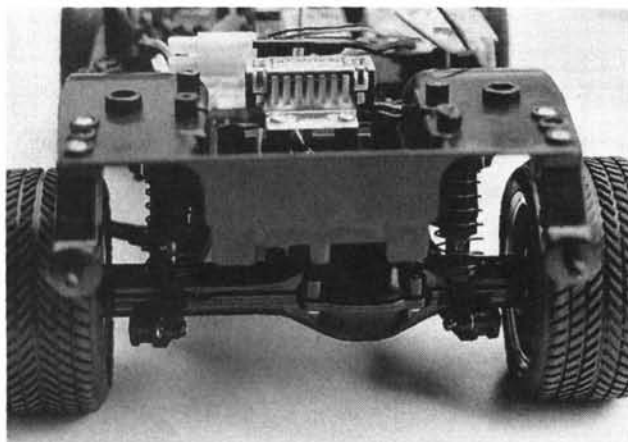


DISLIKES

- Headlights can be functional, why can't the taillights?
- Excessive slop in the front suspension and steering linkage.
- The truck looks so good that you'll be reluctant to drive it!



Above: except for the red springs and shortened shocks, the independent front suspension is the same as on the Jeep and Pajero. Below: the rear suspension also has shortened shocks and red springs.



thoroughly impressed with the Amigo's performance with the electronic hop-ups, and the brakes were a welcome change. Before I knew it, I was doing controlled power slides with confidence, and my smile was in full bloom. Yeah, go, Amigo!

The Tekin 610-G ESC is, in a word, awesome. It performs just as well as any forward-only ESC I've ever tested, and the optional reverse is a must for racing around the neighborhood. The Pro-Line tires worked well on just about every surface, and they actually screeched during hard cornering—a feature that added realism to the driving experience.

FINAL THOUGHTS

The Isuzu Amigo's detailing and 4WD traction is a combination that's hard to beat. Although it isn't a hardcore racing machine, you'll probably enjoy bashing around your neigh-



THINGS YOU'LL NEED

- 2-channel radio system (including two servos and a receiver)
- 6-cell battery pack
- 15-minute, quick-charge battery charger
- Paint (suitable for polystyrene—not Lexan)

borhood with the Amigo more than with any full-blown racing truck. It scores high points in my book, and I highly recommend it to anyone who's looking for a recreational R/C vehicle. Whether you're looking to buy your first R/C vehicle, or for another vehicle to add to your arsenal, I suggest that you kick the Amigo's tires before you make your next R/C investment.

* Addresses are listed alphabetically in the Index of Manufacturers on page 176.

Factory Options

■ Complete sets of sealed ball bearings (part nos. 53008, 53029, 53030, 53065 and 53126) greatly enhance the vehicle's performance and reliability.

■ An R/C light-bulb set (no. 50320).

■ A cross-country, 4WD torque-splitter unit (no. 53188) enhances the vehicle's handling and top speed.

■ A pair of aluminum shocks (no. 53155) also enhances handling and performance.

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Or ONROAD Bodies...



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Long-Tail #3155L • 1/12 scale #4155

Or OVAL Bodies...



• Old's Pro Stock #5005

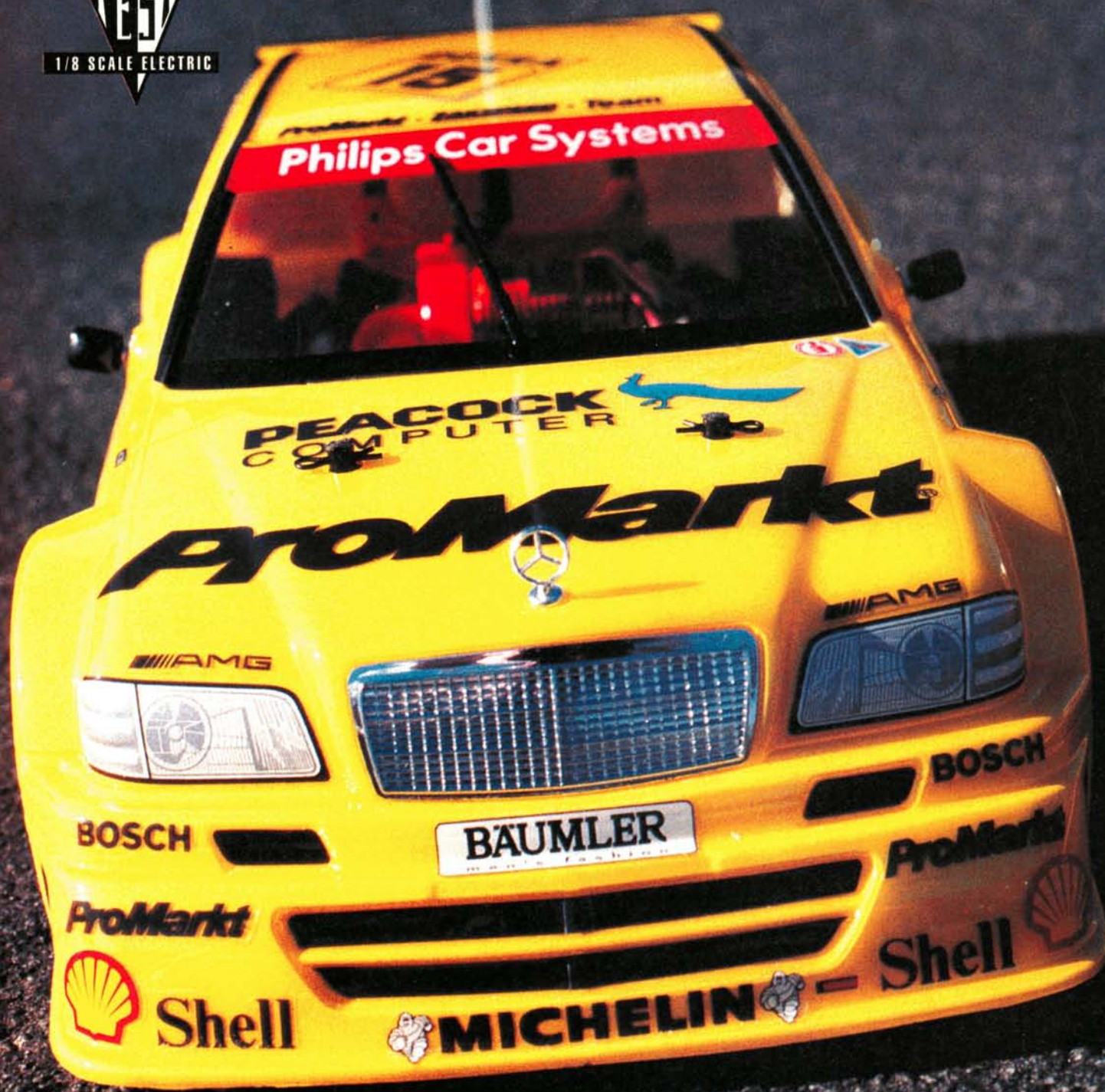


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They don't get any better than this!

PARKING-LOT racers have many reasons to thank Tamiya*. Since the 1970s, R/C enthusiasts have been gathering at shopping centers, churches and school parking lots to match skills and wits. The recent resurgence of this low-stress competition format is due in large part to Tamiya's willingness to continue to introduce low-cost kits. Many participants enjoy the parking-lot format because the cars look and handle like their full-scale counterparts. The drivers are less interested in absolute performance and are engaged more in living out their driving fantasies.

Tamiya ProMarkt Mercedes 4WD Sedan

by Doug Mertes

The ProMarkt Mercedes-Benz is the latest addition to the long-lived and overwhelmingly popular Tamiya 4WD sedan line. Although this kit holds no real surprises in terms of construction and performance, it's an excellent parking-lot racer.

The ProMarkt was Mercedes' response to 1993's dominant Alfa Romeo T155V. Throughout the 1994 DTM (German Touring Car) season, these cars were serious competitors with their awesome 400hp, V6 engines, their bright yellow aerodynamic bodywork and the driving skills of the Netherlands' Jorg van Ommen and Germany's Kurt Thim. These

BUILDING & SETUP TIPS

Tamiya has sold variations on this chassis for more than five years, so they've managed to get all the bugs out of the parts and instructions. The various screw bags and parts trees are well-organized and, in every step along the way, there's a detailed scale drawing of each part that's used. Pay attention to the part numbers in the accompanying exploded drawings, and you'll get through the assembly process without any trouble at all.

• **LUBRICATION.** I used Tamiya's included ball-diff grease when I put the rear differential together, but I put Aero-Car's* Super

Speed gear and diff lube (the pink stuff) on the gear teeth when I assembled the front and rear gearboxes. I've put a half-dozen of these sedan kits together, and this lube yields the most free-running drive train. When

you use a low-powered kit-type motor, every little bit of efficiency helps!

• **BUSHINGS/BEARINGS.** You can install a full set of ball bearings (about \$50), but the bushings included with the kit do a pretty good job of supporting the various axles and drive gears. They'll eventually wear out and get sloppy, but until then, if they're properly lubricated, they'll do their job quite nicely. I used light oil on mine, but I've also had some success with Mobil-1.

• **THE BODY.** The polycarbonate Mercedes-Benz body is highly detailed and comes with a full set of racing decals. The bright yellow body color is easy to paint on (I used Pactra* Daytona yellow), because Tamiya provides a set of window masks that you cut out with a pair of scissors. Even beginners can produce a professional-looking body with this system!

Take your time when you cut out and place the decals (remove the protective coating from the outside of the body first!), and make sure you have a heat gun or hair dryer handy when you put the headlight and taillight decals on the body. They'll lie flat when you soften them up with a little heat. If you're concerned about the exact placement of the larger decals, use

Windex™ or some water with a few drops of liquid dishwashing detergent in it to prevent the sticker from adhering to the body too quickly. You can squeeze the water out from underneath when you're satisfied that it's in the right place. The instructions tell you to paint portions of the rear wing to match the body color, but I found it easier to use MonoKote* trim sheets.

FACTORY OPTIONS

- Ball-bearing set—no. 53167
- Graphite chassis-plate set—53166
- Speed-tuned gear set—53127
- Optional 24- and 25-tooth pinion set—50477
- Nissan, Toyota, Alfa Romeo and BMW body sets
- Interior driver set—50457
- Various tire and wheel sets

SPECIFICATIONS

SCALE1/10
LIST PRICE\$285

DIMENSIONS

Overall length16.75 in.
Wheelbase10.88 in.
Front width8.65 in.
Rear width9 in.

WEIGHT (gross, RTR w/6-cell pack) ..46 oz.

CHASSIS

TypeTub
MaterialPlastic

DRIVE TRAIN

TypeSealed dual transmission with drive shaft
PrimaryPinion/spur
TransmissionGear reduction
Differential
—frontGear diff
—rearBall diff
Slipper clutchNone
Bearings/bushingsBushings



SUSPENSION (F/R)

TypeLower A-arm with fixed upper camber link
DampingOil-filled, plastic-body shock absorber

WHEELS (F/R)

TypeMesh-type, plastic, one-piece

TIRES (F/R)Slick semi-pneumatic

ELECTRICS

MotorStock
Speed controlThree-step mechanical
BatteriesNot included

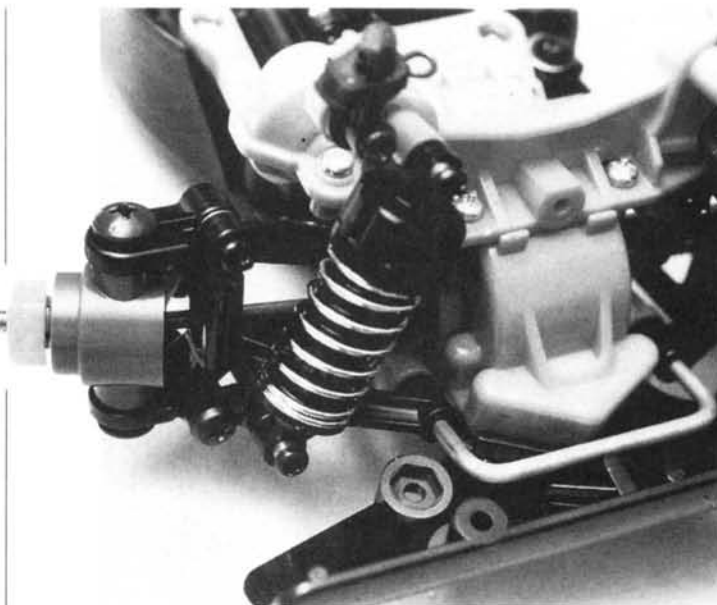
THINGS YOU'LL NEED

- Radio transmitter and receiver
- Steering servo
- Electronic speed control (or second servo for the mechanical speed control)
- 6-cell, stick-type battery pack
- Battery charger
- Paint for the Lexan body

AMG cars can go head to head with Opel Calibras and Alfas in some of the closest racing you'll ever see!

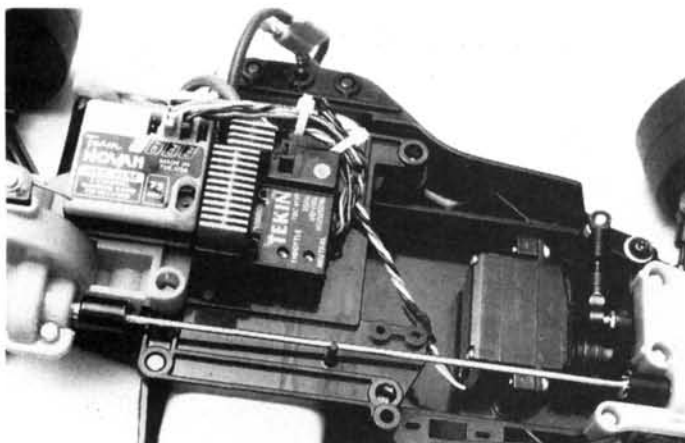
KIT FEATURES

This 1/10-scale version is based on the TA02 chassis—a derivative of the Manta Ray off-road buggy. Compared with the original TA01 chassis, this updated design has wider front-suspension arms and drive shafts as well as a motor that's mounted farther forward. Most of the kit parts are molded out of bright red, white, black and blue plastic resins of varied flexibility. The transmission internals are made out of white-nylon fiber-filled composite, and they spin on polished-steel shafts that ride on both metal and plastic bushings. The rear ball diff and front gear diff transmissions are connected by a metal drive shaft, and the 4W independent-suspension (lower A-arm, fixed



The second-generation TA02 rear gearbox lets you use up to a 25-tooth pinion gear on the motor if you install a smaller spur gear. The wide front arms are an optional upgrade for TA01 kits, but they come standard on the ProMarkt Benz.

There's plenty of space for the electrics of your choice. I used a Futaba S132H servo for steering, but any size servo will fit. If you decide to use the kit's mechanical speed control, you'll need an additional servo.



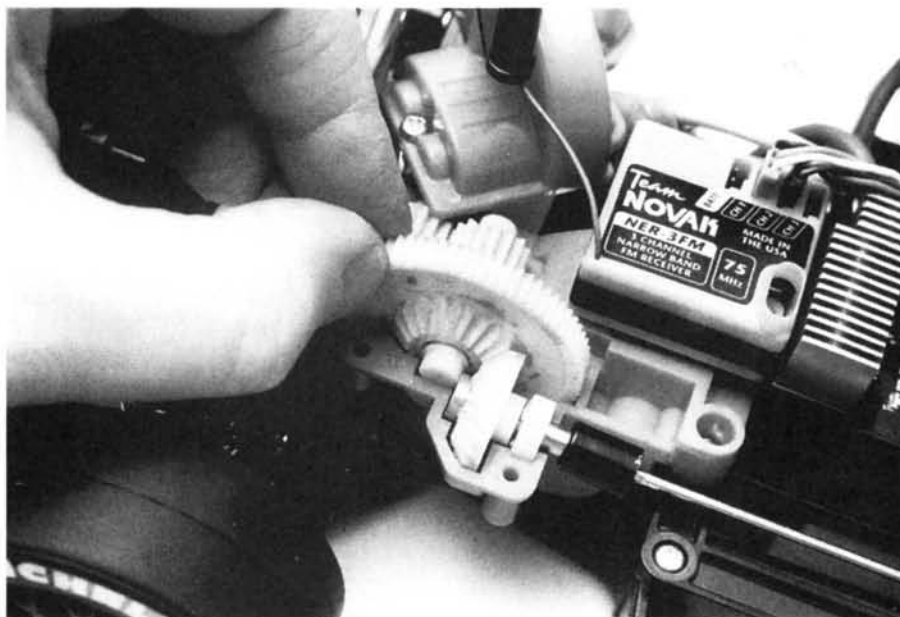
PERFORMANCE

With the relatively limited horsepower coming from the kit's low-timed Mabuchi* motor, it doesn't require a rocket scientist to set up the suspension on the Benz. The kit's instructions do an excellent job of giving you a base-line setup, but I did make a few changes. I used the one-hole pistons on the shock absorber parts tree and, because I knew from experience that the way to get these cars to handle is to firm up the ride, I filled the shocks with 80WT Associated* silicone shock fluid. It also helps to lower the chassis a little. To lower the ride height, I've experimented with various shock spac-

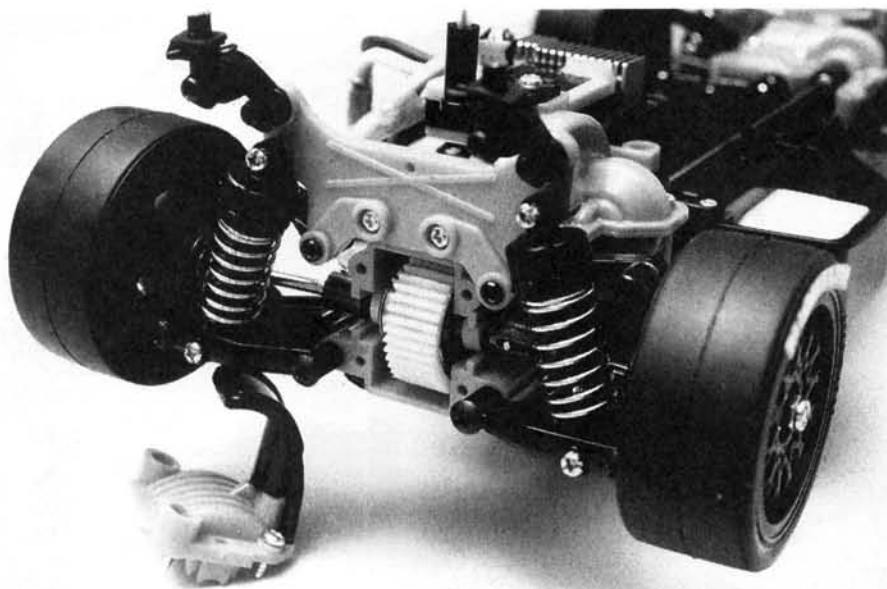
upper link) is controlled by oil-filled, coil-over shock absorbers. A 3-speed mechanical speed control is included with the kit, as are slick rubber tires and one-piece rims.

TEST GEAR

I elected to use an electronic speed control instead of the mechanical one that came with the kit. Any mid-level-performance ESC will do, but I opted for one of my trusty Tekin* 411Ps. I've had several of these since their introduction in 1990, and they've never let me down. The kit's motor provides the power, and I use a Futaba* 132SH servo to handle the steering chores. A Novak* NER-3FM receiver picks up the signal from my JR* 756 transmitter, but for this model you don't need such a high performance radio; any good AM transmitter/receiver combo would also work well. I built this kit out of the box in compliance with Tamiya's Stock Sedan class racing rules (no modifications or aftermarket parts).



The transmissions are simple, strong and efficient. The main spur gear is easy to change; on the rear tranny, just remove the three screws that hold the upper case down.



Remove four screws, and the rear differential is available for a rebuild. That's easy!

ers that fit under the piston, and I settled on 6mm lengths of surgical-rubber fuel tubing (cut out of a 1-foot-long piece that I got at the hobby shop), in addition to the spacers that come with the kit. That brings the car down low, but it doesn't let anything scrape on the pavement. If your parking-lot surface is rough, you'll probably need to use shorter spacers for additional ground clearance.

For each shock absorber, there's an assortment of spring preload spacers included. I suggest using the largest spacer in back and the smaller ones up front. Under power, 4WD sedans tend to understeer; you can combat that by reducing rear traction a little. That tweak will let you make those tight turns without your having to let up too much on the throttle.

The kit motor can also take a whole lot more gearing than is provided by the 21-tooth pinion/77-tooth spur setup that comes with the kit. With 14-minute run times, the motor isn't exactly under a lot of stress. The Tamiya Speed Tuned Gear set is your answer, along with some optional aluminum pinion gears. You can use up to a 66-tooth spur and a 24- or 25-tooth pinion without suffering run-time problems. The black, no. 53068 Tamiya Sport tuned motor (a 23-turn, single-wind, mild, modified that's legal in some race series) or a ROAR '91 24-degree stock motor can use a 66-tooth/22-turn combination for more top speed.

FINAL THOUGHTS

Like the rest of the Tamiya 4WD sedan line, this is a durable, popular design that

has managed to withstand the test of time. It might not be the fastest, best-handling sedan on the market, but it can hold its own with a little work. Across the country, there's a whole series of races that are

likes

- Easy to set up.
- Durable on the parking lot.
- Very realistic body style.
- Lots of them out there; you'll always find someone to race against!

dislikes

- Would prefer metal bushings instead of plastic ones.
- Hinge pins and suspension arms have too much slop, even when they're new.

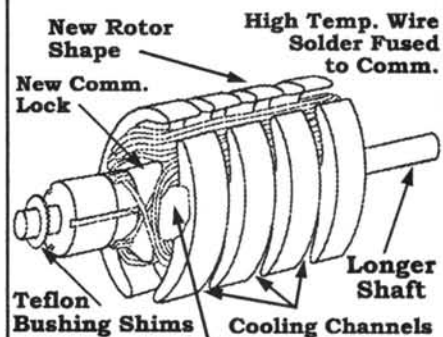
based on this car, including a class that precludes any upgrade options whatsoever. No matter where you go to race on outdoor asphalt, you're sure to find at least a couple of these cars. Even though I own more sophisticated sedan-class cars, it always seems to be one of the Tamiya cars that comes off the shelf when I'm heading for a fun time on the asphalt. Does that tell you anything?

*Addresses are listed alphabetically in the Index of Manufacturers on page 176.

**The PowerZONE Is Back
It's Black and ready to
Attack**

RACE PREP'S New Stock Racing Motor

All new features include the **R-40 Armature**. This new design incorporates a different rotor shape for higher efficiency. The **Cooling Channels** offer 30% better air flow. We've brought back the **Weighted Balancing Method** (Race Prep was first with this in production motors in 1989) for that perfect balance without disrupting the field. **v5.3 Wet Magnets** made from the highest heat resistant material available for more "Punch" with less fade. **Teflon Bushing Shims** reduce side load friction created by gear alignment and increase bushing life.



Weighted Balancing Method
With the same features found in the Purple Haze. "R" Compound Brushes, Diamond Trued Comm., 1.3mm Thick Can, Turbo Dyno Tested, Air Vented Motor Can, and **BUILT in the U.S.A.!!!** Coming soon!



**BACK
ATTACK**
STOCK RACING MOTOR

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S N E A K



P E E K !

by Frank Masi

XX & XXT Budget Racers

TO APPEAL to a wider range of buyers, it's common practice for makers of high-performance automobiles to offer "stripped" versions of their top-line cars. Legions of customers are more than willing to forego such amenities as cruise control, leather seating and power cupholders if the price is right—provided that the spirit and performance of the automobile remain intact. Forty-five thousand a bit too steep for a new turbo Supra? Get the non-turbo version, and you'll save 10 grand and still look cool.

Team Losi fights sticker shock!

Team Losi[®] has brought this philosophy "in-house" and applied it to its national-championship-winning duo—the Double-X buggy and Double-XT racing truck. That's right; you'll soon be able to march down to your hobby store, plunk down about 130 bucks and walk out with virtually the same car that made up the front row of the last IFMAR Off-Road World Championships. And in the bargain, you'll get a spiffy new mechanical speed control and a 540-size stock motor.

FROM CONCEPT TO REALITY

When these new "entry-level" incarnations of the Double-X and Double-XT go on sale this fall, don't expect new names or vastly different packaging. Only the part number on the box will be



different. Team Losi wants to make it crystal clear that these vehicles aren't cheap imitations made with less expensive materials; these are the real things, just "base" versions.

Why would Team Losi introduce a pair of entry-level vehicles when it already produces the Junior Two buggy and the Junior-T truck? Gil Losi Jr. admitted that the decision was inevitable. "We know that customers have come to expect a lot of technology from Team Losi, even in our entry-level stuff. It was a logical decision, really. The technology of the Junior series is more in line with the imported products than with our more direct competition here in the U.S."

"All of the really big design stuff for the Double-X buggy and truck had already been done. We thought that creating entry-level models from these basic platforms would simply be a matter of swapping out some of the more expensive features to cut the cost. But once the project started, we realized that it wasn't going to be that easy to make something that we'd be happy with."

XX & XXT Budget Racers

What's different, really?

So, what's the difference between the new base models and the more

expensive racing versions? Not as much as you might think. Here's how Team Losi pulled off a pricing coup.

Bushings instead of ball bearings.

To reach the targeted price for the new vehicles, including a full set of ball bearings was out of the question. Lubricant-impregnated bronze bushings are used throughout the new buggy and truck. The exceptions are the large, transmission output bushings, which are made of a special dual-element (steel and bronze) material and a sealed ball bearing on the motor-plate side of the tranny's input shaft. Special, steel front axles, which greatly extend the life of the front wheel bushings, come with the Double-X.

Friction slipper clutch without Hydra Drive.

Except for the omission of the Hydra Drive unit, the base models sport the same friction slipper clutch as the full-race versions. The optional Hydra Drive unit bolts right onto each new models' slipper shaft without modification.

Molded slider-shafts instead of dogbones.

The decision to switch from the top versions' steel dogbones to molded slider shafts was less about cost and more about performance. Losi predicts that the majority of the base model Double-Xs and Double-XTs will see more action in backyards and sandlots than on groomed racetracks. For this reason, the sliders were chosen, because they allow the rear suspension to move more freely—better for un-groomed surfaces. Sliders are less likely to be fouled by dirt that would cause binding and wear, so they should last longer than dogbones would under similar conditions.

Special, molded differential halves were produced to adapt the sliders to the Double-X transmission. A neat little slot in one of the halves allows you to insert a small, flat-blade screwdriver to set the diff adjustment.

Team Losi's new speed control.

When we first found out about this project from Losi insiders, we were very surprised to learn that the kits would be available with an optional mechanical speed control and stock motor.

According to Gil Jr., "We've known for years that we were at a disadvantage in the beginner market, because we didn't offer a speed control in our entry-level kits. The trouble was, we didn't want to just throw any speed control into our kits. We looked around at what other manufacturers were doing, but didn't really see anything we liked. When we decided to make the new car and truck, we also decided to design our own speed control for a more complete entry-level package."

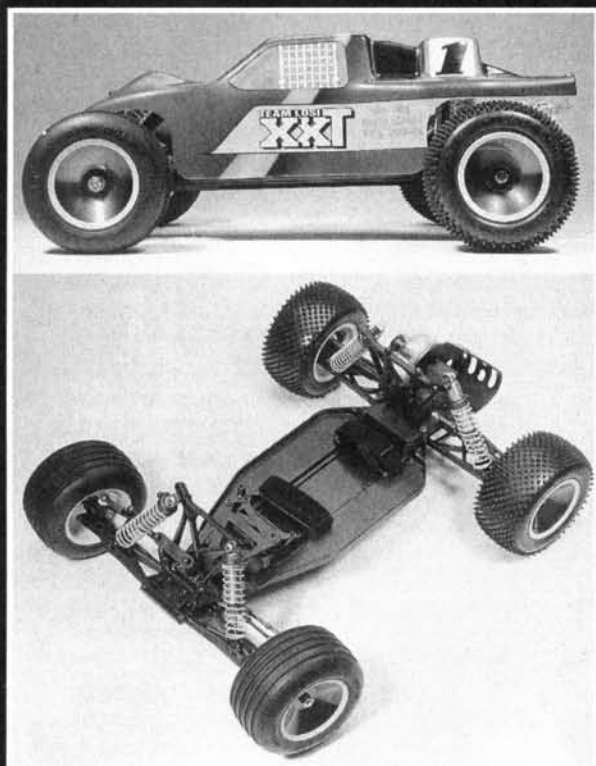
The new speed control consists of an aluminum plate that attaches to any servo with double-sided tape. A portion of the plate is bent outward to hold a special resistor that Losi made specifically for this project. This resistor is a "50/50"-type, which means that half of its contacts control forward speed and half activate brakes. "Most of the inexpensive AM radios don't have end-point adjustments or sub-trims," comments Gil Jr. "Their throttles are usually half forward, half brakes, so we wanted to have a speed control that would be easy to match to the types of radios most beginners own."

The speed control comes pre-wired (with a built-in BEC plug), so you don't have to worry about soldering it yourself. Kits will be available with and without the mechanical speed control, and those "with" will also come with a sealed-endbell, 540-type motor and a 48-pitch pinion gear of the appropriate size. Losi predicts that the majority of the new buggy and truck kits will be sold with the speed control and motor.

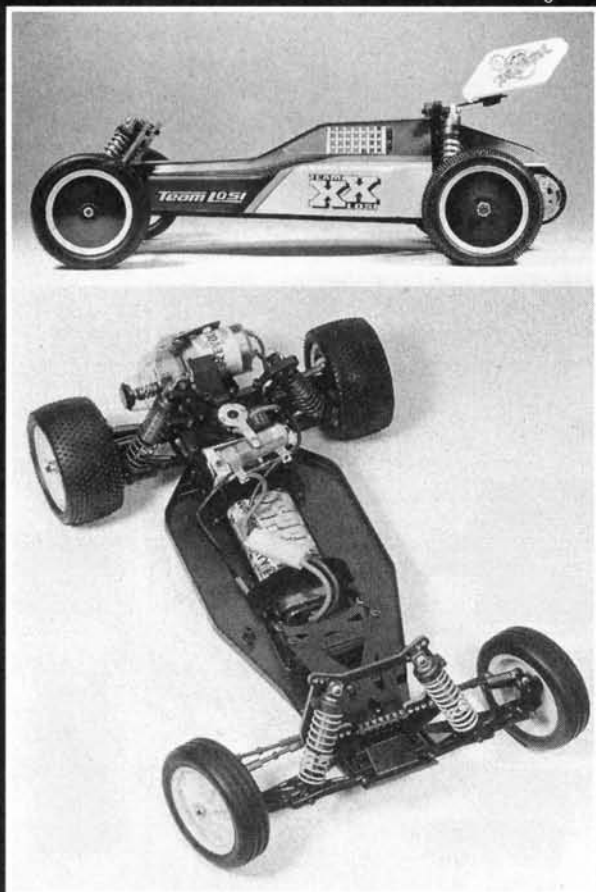
Anodized shock bodies instead of hard-coated.

The new buggy and truck use the same shocks as those found on the more expensive models. The only difference is that the shock bodies used on the base versions are of gray-anodized aluminum; they're not hard-coated. Otherwise, the shock shafts, pistons, seals and springs are identical.

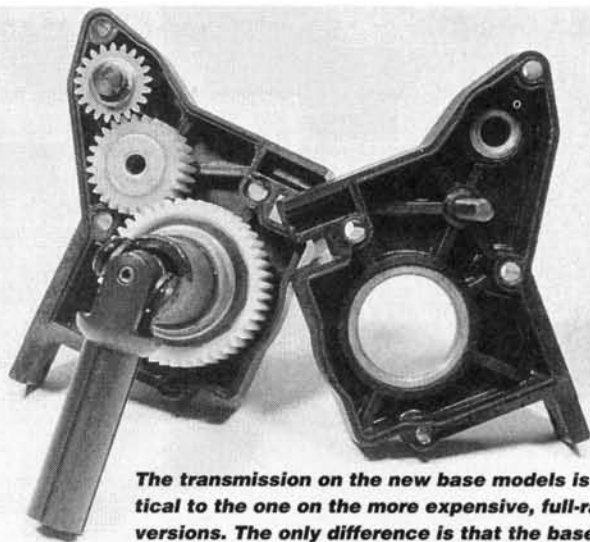
TEAM LOSI XX & XXT BUDGET RACERS



Other than the gray-anodized shocks, this budget Double-XT looks just like its full-blown racing brother.



Team Losi included a speed-control unit and motor to help you get a jump-start on a cost-controlled off-road racing career.



The transmission on the new base models is identical to the one on the more expensive, full-race versions. The only difference is that the base models use metal bushings instead of ball bearings.

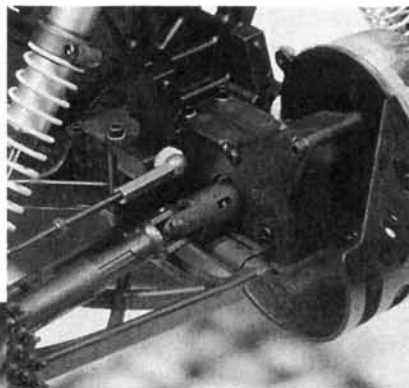
DELIVERING THE GOODS

These new Double-X and Double-XT base versions are perhaps the most important new products ever produced by Team Losi. When you see and handle them, it's much easier to notice the similarities between them and the full-race versions than the differences. In fact, you really have to "know your Losi" to see what's missing!

For manufacturers of R/C racing vehicles, national and

stock or mod motor, etc.).

When they hit the track, the base versions look and perform nearly the same as the vehicles used by



Above: to improve performance during typical backyard abuse, Losi has adapted molded slider shafts to the Double-X and Double-XT base models. Special, molded diff halves were made to fit the sliders to the Double-X tranny's existing diff parts. Left: Team Losi's new mechanical speed control uses a "50/50"-type resistor to better match the performance of budget, AM radio systems. Half of the resistor's contacts control forward speed, and the other half control braking. A BEC plug is included.

international race organizers and neighborhood clubs, a common and very serious problem is how to get beginners interested in racing. The release of these new base versions opens the doors to tracks across the country to those who'd like to go racing but who aren't ready to buy a full-race Double-X or Double-XT and the necessary gear with which to run one (ESC,

the more advanced racers; they inspire confidence in their drivers. I can't say that Team Losi originated the idea of offering base versions of its racing machines, but these two new models are about the most impressive and complete "budget" off-road racers available today.

* Addresses are listed alphabetically in the Index of Manufacturers on page 176. ■

HOW TO

Sedan Tuning & Setup Tips

THE TOURING CAR craze has hit! These cars come in front-wheel drive (FWD), rear-wheel drive (RWD) and four-wheel drive (4WD) configurations, and they're a ball to race.

I'll go over a few tips that will help your 4WD sedans perform at their best. I'll deal mostly with the Tamiya* TA02 4WD cars (such as the Alfa 155V6 and ProMarkt Mercedes) and the Kyosho* EP-10 Spider 4WD, but some of my tips will be just as useful with other sedans.

First, I'll let you in on some setup tips that have to do with setting camber, toe-in, toe-out and ride height properly and adjusting the springs and damping. After that, I'll check out the oodles of available aftermarket parts to show you some add-ons that you might want to consider; and, for the "Gotta have it all!" crowd, I'll show some of the available high-end parts.

Tuned to ZOOM

by ERIC AAKRE



Two of the most popular touring-car chassis. The Kyosho chassis (right) uses a belt drive to power the front wheels, while the Tamiya (left) uses a shaft drive. Which system is more effective? They both work well, though Kyosho's is thought to be more efficient, and the Tamiya's is more resistant to dirt penetration.

The first thing you'll notice about these sedans is that they're relatively narrow when compared with other on-road cars, e.g., pan cars such as the Associated* 10L, Trinity* EV10, etc. They're narrow because they're actually $\frac{1}{10}$ scale, right down to the width. A traditional $\frac{1}{10}$ -scale pan car is actually about $\frac{1}{8}$ scale in width and $\frac{1}{6}$ scale in length. But the narrower the car, the more likely it will be to roll over when turned at high speed. To cure this, you can lower the ride height.

Out of the box, these sedans are set

way too high to go racing, but they can be lowered by placing spacers inside the shocks. Stack the spacers under the pistons to limit the shock's down-travel. How many spacers depends on how low you want your ride height; $\frac{1}{4}$ inch of ride height is a good place to start. Any plastic, $\frac{1}{8}$ -inch-inside diameter spacer will work, and they're available from Team Losi* and Associated.

HPI's* aftermarket front and rear lowering kits for Tamiya touring cars (part nos. 6410 and 6400) make this modifica-

Camber is Crucial

Camber adjustment is very critical for any racecar; it controls the way in which your car's tires contact the ground. When you lower your sedan's ride height, the first thing you'll notice is excessive negative camber, i.e., the tops of the wheels lean too far inward, toward the center of the car.

If you have the right amount of negative camber in the front and rear ends (about 3 degrees), the tires' sidewalls will be less likely to roll under the rim and "trip" the car.

In general, you set camber by adjusting the car's upper links until the tires wear evenly across their width. The only problem is that, with the real rubber tires that these touring cars come with, it's sometimes hard to tell how the tires are wearing; this is especially true of slicks. You can set camber by using a camber gauge such as the one from RPM*, or if you don't have a gauge, just place a soda can next to the tire so that the bottom of the can touches the tire's sidewall. Then measure the distance from the top of the tire to the side of the can. On a sedan-size

Camber is critical to any racecar; don't overlook it! If you don't have a camber-measuring gauge, a soda can and ruler will do in a pinch.



HOW LOW CAN



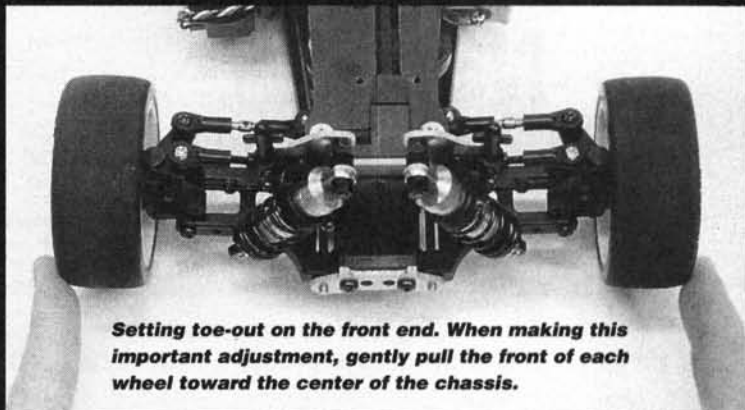
Out of the box, these sedans are set way too high to go racing, but they can be lowered by placing spacers inside the shocks.

tire, a measurement of about $\frac{1}{8}$ inch should equal 3 degrees of negative camber.

The upper camber links on Tamiya sedans can't be adjusted, so the only way to change camber is by replacing them with aftermarket upper link sets, which are available from Tamiya (Tam 53192) and Kose* (K-1960, front; K-1961, rear). Kyosho's Spider and Yokomo's* YR-4 chassis have adjustable links.



TOE ADJUSTMENT



Setting toe-out on the front end. When making this important adjustment, gently pull the front of each wheel toward the center of the chassis.

The terms "toe-in" and "toe-out" refer to the angle of the front and rear wheels when looking at the car from the top. If the wheels have toe-in, their fronts are pointing inward, and they have toe-out if their insides are pointing outward.

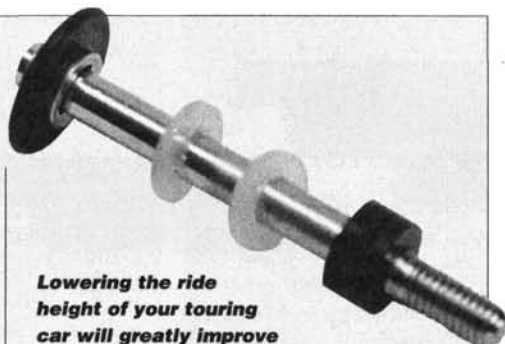
For a 4WD car, about 2 degrees of front-wheel toe-out is a good starting point. This will help the car to track straight and

to turn more consistently. When checking toe-out, grasp the front edge of each front wheel and pull them inward, toward the center of the car. Doing this takes out any slop in the steering linkage that might give you a false reading of the amount of toe angle. There's no definitive way to measure toe-out on a touring car chassis using a gauge. RPM makes a toe gauge, but it's intended more for off-road cars. Most racers just "eyeball" this setting.

If you need to adjust toe-in or toe-out on a Tamiya car, you'll have to go to the aftermarket section for the Tamiya steering-link set (Tam 53191) or the Kose link set (K-1962). Both are of high quality and do the job nicely. Unfortunately, the rear toe-in on the Tamiya car can't be changed, so you have to live with it where it is, but the Kyosho car's rear toe-in can be adjusted with inexpensive, optional, rear toe-in plates.

tion a bit easier. These kits are basically replacement shock towers that raise the shock's upper mounting point, which, in turn, lowers the car's overall ride height without the need for shock-travel-limiting spacers.

Unfortunately, lowering the car's ride height upsets its camber settings. You will have to re-adjust camber to suit the car's lower height. See the sidebar on camber setting to find out how to set camber and how much is needed for most sedans.



Lowering the ride height of your touring car will greatly improve its handling. Small washers placed inside each shock limit down-travel and really do the trick.

YOU GO?



Stock vs. aftermarket: chassis components for Tamiya touring-car chassis.

Now that we've covered the basic tuning of a 4WD touring car chassis, let's look at some of the many available aftermarket parts. But remember: an aftermarket part won't necessarily perform better than the stock part. With this in mind, let's start with the essentials.

AFTERMARKET ADD-ONS

THE RACING NECESSITIES

First, add a set of ball bearings, which are available from many manufacturers—all fine, I'm sure. If you like to stick with Tamiya parts, you'll need part no. Tam 53073 for a TA01 chassis, and Tam 53167 for the TA02. The Kyosho set is part no. KYOC2189.

Sedan Shock Settings



Kose aftermarket hop-ups for Tamiya touring cars: shock, A-arm, hub carrier, spindle and bulkhead. Beautiful stuff!

The shocks that come with Tamiya and Kyosho touring cars are similar in that they have a plastic body and cap and a double O-ring seal at the bottom, and they're fine to start with.

For the Tamiya car, I recommend 40 to 50WT shock oil and a one-hole piston. In the Kyosho, use the one-slot piston with 70 to 80WT oil. I like Trinity's silicone shock oil, which comes in all the popular weights and half weights, and its viscosity remains consistent in all temperatures. When you have the damping you want, it's time to look at the springs.

When the damping is made stiffer, stiffer springs must also be used. The springs that come with the Kyosho car are fine, but the ones that come with Tamiya cars are too soft. Never fear though; Tamiya offers a spring set (Tam 53163) with three spring rates to choose from. The springs of choice at my track are blue springs in the rear and yellows up front. One nice thing about the Tamiya springs is that they will work on the Kyosho car as well.

The next necessity is an upper link set.

After that, you'll need the spring set I mentioned in the shock-setting sidebar.

Also on the list of necessities for 4WD is a front, one-way drive assembly, which replaces the front differential and increases off-power steering dramatically (in other words, you'll have more steering when coasting or braking). At more established parking-lot tracks and against more experienced drivers, you may need a one-way front drive unit to be competitive. (Tam 53200; Kyosho W-5111). Kose also sells a nice one for Tamiya cars (K-1902B), and so does HPI.

Another important upgrade is to replace the propeller shaft in the TA01 and TA02 4WD Tamiya cars. These cars are usually run with modified motors, and the stock shaft does not hold up. Ask for parts no. Tam 53079 (TA01) and Tam 53152 (TA02). Kose also sells some really trick propeller-shaft replacements such as the car-

bon shaft they make for the TA02 chassis (K-0625) and the spring-loaded universal shaft for the TA01 chassis (K-0815). As far as absolute racing necessities go, this should be all you need to be competitive with either car.

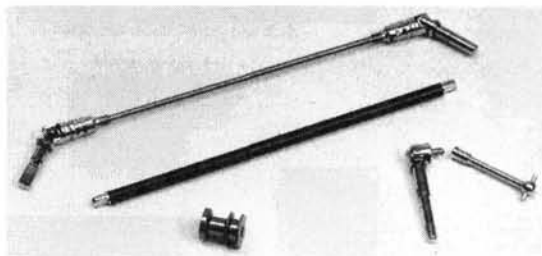
WORTHWHILE, BUT NOT ESSENTIAL...

• **For Tamiya cars.** This list is almost endless. Let's look at some of the most useful and some of the ultra-trick as well.

At some tracks, a sway-bar kit is essential, and Tamiya makes a nice one (Tam 53189). A sway bar helps to minimize chassis roll and helps a car to pivot in the turns, off power.

From Kose, front and rear universals help to eliminate the drive-train slop that occurs naturally in these cars. (Kose calls these "Change Bones" because if you accidentally bend one, you can replace the shaft part without changing the whole universal. Pretty trick!)

Kose also makes a front-end reinforcement kit that helps to eliminate slop and flexing (K-1905B).

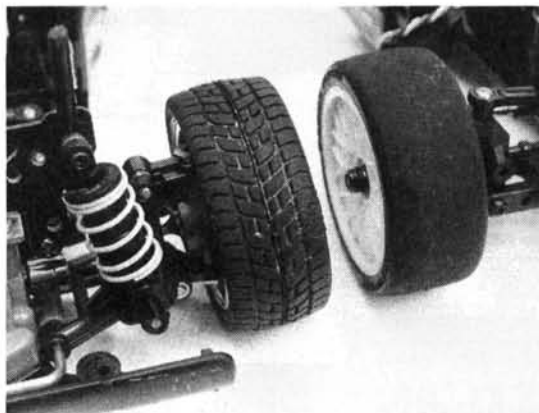


More Kose parts. A replacement prop shaft for the Tamiya chassis lets you use faster motors without failure. Kose's Change Bones are unique; they allow you to change a bent shaft without changing the universal joint.

Try a set of aluminum shocks. They don't necessarily perform better, but they are more durable and will last longer. Both Tamiya (Tam 53155) and Kose (K-0604Y/long; K-0620Y/short) make a good quality set of shocks that work well. And the Kose shocks come in long and short versions and include the springs.

Aftermarket wheels and tires work on Tamiya and Kyosho cars. Tamiya offers three types of real rubber tires, two types of inner sponge and an assortment of rim styles (see the "Sedan Wheel and Tire Guide" in the October '95 issue). My favorite Tamiya rim/tire combination is the new Opel Calibra rim (Tam 50634) and the new treaded tire (Tam 53214) with the standard, super-slick inner foam (Tam 53113).

For touring cars, the most popular rims and tires are probably the HPI line, which includes a 5-spoke rim and a 7-spoke rim in chrome and black, in both wide and standard widths. In the tire department, they offer treaded and "slick" wide and narrow tires. My favorite combination is the standard-width, chrome, 7-spoke wheel (HPI 3558) and the



Treaded tire vs. slick. Slicks tend to have more traction, but treaded tires are more predictable and work better on sandy pavement.

standard treaded tires (HPI 5130). I prefer treaded tires to "super-slick" tires because they seem to slide more consistently and predictably. The slick tires seem to have more bite, but when they do break loose, you've had it. Pro-Line* makes Sedan Hawgs to fit all popular touring car wheels, and they work well because they're molded in Pro-Line's trick XTR compound.

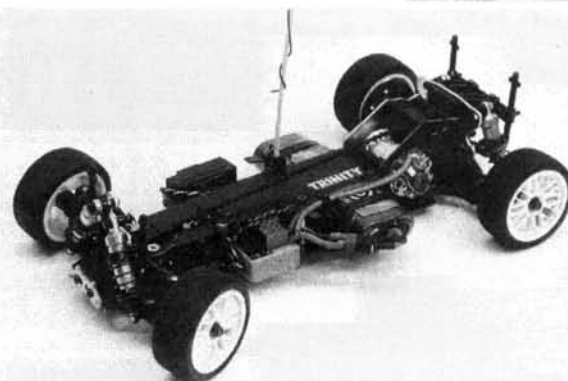
PART	PART NO.
TAMIYA	
Manta Ray BB set	53073
Touring car BB set for TAO2 chassis	53167
Manta Ray ball diff.	53070
One-way diff	53200
SS prop shaft	53079
SS prop shaft for TAO2 chassis	53152
Aluminum shock set	53155
Spring set	53163
Treaded tires	53214
Calibra wheel set	50566
Inner sponge set	53113
Sway-bar kit	53189
Steering-linkage set	53191
Upper arm set	53192

KOSE	
Long shock set	K-0604
Short shock set	K-0620
Carbon propeller shaft	K-0625
SS spring loaded prop shaft	K-0815
Front-end reinforcing kit	K-1905B
Adjustable upper arm (F)	K-1960
Adjustable upper arm (R)	K-1961

HPI	
U/L-deck graphite chassis	8020
Molded chassis	8106
7-spoke chrome wheels	3558
Treaded tire (standard width)	5130

KYOSHO	
Sway-bar kit	KYOC5945
2-speed tranny	KYOC6173
Universals	KYOC6121 (short); KYOC6120 (long)

BB = ball bearings; SS = stainless steel;
U = upper; L = lower; F = front; R = rear.



Kyosho's Spider 4WD electric chassis—a great performer, but it has been replaced by the new Kyosho TF-2 chassis. Spider owners shouldn't fret, because Kyosho continues to offer all sorts of cool mods for this potent chassis.

• **For the Kyosho Spider.** A rear ball differential helps handling, and there are sway-bar kits, springs sets, a carbon chassis and even a 2-

speed tranny available from Kyosho.

REALLY INSANE PARTS...

If you're into the really expensive trick parts, there are plenty to choose from.

• **For Tamiya cars.** From Kose, come some really nice, aluminum, lower A-arms and outer hub carriers along with aluminum front bulkheads that change the front caster to help on-power steering. Other wild upgrades are the HPI replacement chassis, which has graphite upper and lower decks (HPI 8020), and HPI's really trick, molded chassis that positions the battery pack along the car's center (HPI 8106).

• **For the Kyosho Spider.** There's now a 2-speed transmission that can be bolted directly onto the Spider's top transmission shaft; this addition will definitely give you an advantage on long straightaways.

Well, that just about does it for the tuning of and buying aftermarket parts for the sedans out there. Keep in mind that I've only covered a few of the available upgrades. I've heard rumors about people spending more than \$1,000 on tricking out their sedans; but remember, you still have to drive it when it has been completed, and all the trick parts in the world won't steer it around the track like Joel Johnson.

If you stick with the essentials I've mentioned and add a couple of other parts, such as a ball differential, you'll have a very competitive car; and you can keep the aftermarket spending to only \$150 to \$200 for the Tamiya and less than \$100 for the Kyosho.

*Addresses are listed alphabetically in the Index of Manufacturers on page 176.

NORRCA OFF

Survival of the dirtiest

by George Gonzalez

THIS YEAR, THE NORRCA Off-Road Nationals were held at one of Southern California's premier R/C racing tracks—So Cal R/C Raceway, in Garden Grove, CA—and the weather and the racing action sizzled.



Over 200 racers from all over the country were in attendance. As always, to allow the sportsman racers to compete with other non-sponsored racers of their own skill and budget levels, NORRCA provided a separate class for the factory drivers and sponsored drivers.

GET BACK TO CLASS

The NORRCA Nats was a full venue with 11 racing classes. The racing classes included: 2WD Stock; 2WD Modified; Stock Truck; Modified Truck;

Expert 2WD Stock; Expert 2WD Modified; Expert Stock Truck; Expert Modified Truck; Expert 4WD Modified; Factory 2WD Modified; and Factory Modified Truck. Four rounds of qualifying were scheduled in each, and the expert and factory drivers faced triple A-Mains in which points were accumulated according to their finishing positions (first = 100 points; second = 99 points; third = 98 points, etc.). Every driver's lowest score was tossed or used only as a tie-breaker.

The factory teams—Team Associated and Team Losi—competed for the Eighth Annual Team Cup Challenge. They chose drivers to represent their team, and points were accumulated according to their finishing positions. The team with the most points took home the honor of being the best off-road racing team of 1995.

-ROAD

QUALIFYING

• **Expert.** It was all Sohrab Tavakoli; he raced in all four classes and ended up with an amazing three TQs. In both the Modified 2WD and truck classes, he finished one lap ahead of his competition, and was a full 5 seconds ahead of Jimmy Babcock in the Stock Truck class. Matt Lee took the TQ honors in the 2WD Stock, while Jimmy Babcock and Kareem El-Sherif also put on great performances.

• **Factory.** After four grueling rounds of qualifying, Team Losi/Trinity driver, Brian Kinwald walked away with the TQ in the 2WD Modified, while Team Associated driver Mark Pavidis took the TQ in Modified Truck. Pavidis also picked up the TQ in Expert 4WD Modified—just for the heck of it.

A-MAIN ACTION

• **Expert 2WD Stock.** After the first two Mains, Jimmy Babcock was ahead on points, but both Matt Lee and Jade Kurtchi were within striking distance of the national championship. In the third Main, Matt Lee's Double-X shot out in front and said "Catch me if you can." Throughout the race, Matt was never challenged, and he took the NORRCA 2WD Stock National Championship by storm. Jimmy Babcock had to settle for second place, while Jade Kurtchi ended up with the show position.

• **Expert 2WD Modified.** Sohrab Tavakoli won the first two Mains, and that gave him a perfect 200 points and the NORRCA Expert 2WD Modified National Championship. It was that simple. Billy

NEW IN THE PITS

Japan R/C Imports. Several racers used lightweight graphite shock towers from Fibre-Lyte Products. Available through Japan R/C Imports*, they're available for the popular Losi and Associated cars and trucks. Yokomo YZ-10 owners can also deck out their rides with these trick-looking shock towers.



LRP. Jürgen Lautenbach from LRP made the trip from Germany to promote LRP's new Digital ICS speed controls (distributed by Associated*). These hot, new speed controls feature super-high-frequency operation, a super-low "on" resistance and a current limiter with several torque settings for excellent "tunability." Several Team Associated drivers used them very successfully. Team Associated factory driver Mark Pavidis TQ'ed and won the Modified Truck National Championship with an LRP Digital ICS speed control mounted on his RC10T2.

Ballistic Batteries* has moved and is under new management. Patrick Kivin bought the California-based company and moved it to Phoenix, AZ. At the NORRCA Nats, he was on hand to help the drivers with all their battery needs, and he brought along some hot new products.

The company's new car travel case has a divider that's secured with Velcro® brand fastener, and it will hold two cars (or one truck, a radio and batteries) side by side instead of one



on top of the other. The case is flat enough to fit easily under the seat or in the overhead luggage compartments on airplanes. Ballistic Batteries also offers a new battery bag that holds six battery packs (six or seven cells) and rolls up for easy storage. The battery bag has a clear flap for battery bars, capacitors, or spare parts, and it's a perfect complement to the company's travel bag. Pretty trick!

Nats

NORRCA's New Rule "Three tire changes only."

To keep down the cost of racing, NORRCA passed an "only three sets of tires" rule. It was up to the drivers to determine when they should change tires (no more tire changing between heats), and this added a new twist to the event.

Some drivers used one set of tires for the qualifying heats and two for the Mains, while others did the opposite. The NORRCA technical staff branded every tire with an iron and gave the wheels a serial number, so there was no way to cheat.

Most of the racers liked the new policy because they were able spend their cash on other necessary items, but I'm sure the new rule was controversial among the mega-buck factory teams.

1995 NORRCA Off-Road Nats Winners

FACTORY MOD 2WD BUGGY

Fin.	Qual.	Name	Chassis	Motor	Battery	ESC	Radio	Body	Tires
1	2	Greg Hodapp	Losi	Maxtec	World Class	Tekin	Airtronics	Losi	Losi
2	1	Brian Kinwald	Losi	Trinity	Trinity	Novak	Airtronics	Losi	Losi
3	3	Scott Hughes	Associated	Reedy	Reedy/Orion	LRP	Futaba	RCPS	Losi/Pro-Line
4	4	Mark Pavidis	Associated	Reedy	Reedy/Orion	LRP	Airtronics	RCPS	Losi/Pro-Line
5	5	Matt Francis	Associated	Reedy	Reedy/Orion	LRP	Airtronics	RCPS	Pro-Line
6	6	Rick Hohwart	Associated	Peak	Orion	Novak	Futaba	RCPS	Losi/Pro-Line
7	7	Scott Brown	Losi	Trinity	Trinity	Novak	JR	Losi	Losi
8	8	Mark Francis	Associated	Reedy	Reedy/Orion	LRP	Airtronics	RCPS	Pro-Line
9	9	Matt Ledger	Associated	Reedy	Reedy/Orion	LRP	JR	RCPS	Losi/Pro-Line
10	10	Dean Karns	Losi	Scotlers M/works	Powerline	Novak	Airtronics	Losi	Losi

FACTORY MOD TRUCK

Fin.	Qual.	Name	Chassis	Motor	Battery	ESC	Radio	Body	Tires
1	1	Mark Pavidis	Associated	Reedy	Reedy/Orion	LRP	Airtronics	RCPS	Pro-Line
2	3	Greg Dennett	Associated	Reedy	Reedy/Orion	LRP	Airtronics	Losi	Pro-Line
3	2	Brian Kinwald	Losi	Trinity	Trinity	Novak	Airtronics	Losi	Losi
4	10	Barry Baker	Losi	Maxtec	Stealth	Novak	Airtronics	Losi	Losi
5	5	Greg Hodapp	Losi	Maxtec	World Class	Tekin	Airtronics	Losi	Losi
6	6	Jason Ruona	Associated	Reedy	Reedy/Orion	LRP	Airtronics	Associated	Pro-Line
7	7	Mark Francis	Associated	Reedy	Reedy/Orion	LRP	Airtronics	RCPS	Pro-Line
8	9	Scott Brown	Losi	Trinity	Trinity	Novak	JR	Losi	Losi
9	4	Rick Hohwart	Associated	Peak	Orion	Novak	Futaba	Associated	Pro-Line
10	8	Matt Francis	Associated	Reedy	Reedy/Orion	LRP	Airtronics	RCPS	Pro-Line

EXPERT 4WD MOD

Fin.	Qual.	Name	Chassis	Motor	Battery	ESC	Radio	Body	Tires
1	1	Mark Pavidis	Yokomo	Reedy	Reedy/Orion	LRP	Airtronics	Yokomo	Pro-Line
2	5	Derek Furutani	Yokomo	Extreme	World Class	Tekin	Sanwa	Yokomo	Losi
3	3	Scott Hughes	Yokomo	Reedy	Reedy/Orion	LRP	Futaba	Yokomo	Pro-Line
4	4	Pat Feschtschenko	Yokomo	Evolution	Mega	Helbing	KO	Pro Tech	Losi
5	2	Matt Ledger	Yokomo	Reedy	Reedy/Orion	LRP	JR	Yokomo	Pro-Line
6	6	Matt Lee	Yokomo	Maxtec	Badd Boyz	Tekin	Airtronics	Yokomo	Losi
7	7	Jason Ashton	Yokomo	Race Prep	Ballistic	Tekin	Airtronics	Yokomo	Losi
8	8	John Valentia	Yokomo	Trinity	Trinity	Novak	JR	Yokomo	Losi
9	10	Jeff Whitman	Yokomo	Matrix	Double Strike	Tekin	Airtronics	Yokomo	Pro-Line/Hot Shoes
10	9	Bryce Beaver	Yokomo	Reedy	Reedy	Tekin	Airtronics	Yokomo	Pro-Line

EXPERT 2WD STOCK BUGGY

Fin.	Qual.	Name	Chassis	Motor	Battery	ESC	Radio	Body	Tires
1	1	Matt Lee	Losi	Maxtec	Badd Boyz	Tekin	Airtronics	Losi	Losi
2	2	Jimmy Babcock	Losi	Maxtec	Ballistic	Novak	Airtronics	Losi	Losi
3	4	Jade Kurich	Losi	Extreme	World Class	Tekin	Airtronics	Losi	Losi
4	3	Kareem El-Sherif	Losi	Peak	Orion	Novak	Airtronics	Losi	Losi
5	5	Sohrab Tavakoli	Losi	Peak	Orion	Tekin	Airtronics	Losi	Losi
6	7	Brian Heiges	-	-	-	-	-	-	-
7	10	Al Mazurkewycz	Losi	Warlock	Racers Edge	Tekin	Airtronics	Losi	Losi
8	9	Patrick McCarsen	Losi	Precision	Badd Boyz	Tekin	Airtronics	Losi	Losi
9	8	Alex Guerrero	Losi	Peak	Orion	Novak	Airtronics	Losi	Losi
10	6	Cary Bennett	Losi	Peak	Zig	Novak	Airtronics	Losi	Losi

EXPERT 2WD MOD BUGGY

Fin.	Qual.	Name	Chassis	Motor	Battery	ESC	Radio	Body	Tires
1	1	Sohrab Tavakoli	Losi	Peak	Orion	Tekin	Airtronics	Losi	Losi
2	2	Billy Easton	Assoc	Reedy	Reedy/Orion	LRP	Airtronics	RCPS	Losi/Pro-Line
3	4	Al Mazurkewycz	Losi	Warlock	Racers Edge	Tekin	Airtronics	Losi	Losi
4	9	Colin Macrae	Associated	Reedy	Reedy	Novak	Airtronics	RCPS	Losi/Pro-Line
5	8	Jimmy Babcock	Losi	Maxtec	Ballistic	Novak	Airtronics	Losi	Losi
6	3	Curtis Schlaht Jr.	Losi	Peak	Orion	Tekin	Airtronics	Losi	Losi
7	5	Matt Lee	Losi	Maxtec	Badd boyz	Tekin	Airtronics	Losi	Losi
8	7	Brent Thieke	Losi	Race Prep	Ballistic	Novak	Airtronics	Losi	Losi
9	6	Scott Burns	Associated	Parma/PSE	Parma/PSE	Novak	JR	RCPS	Pro-Line
10	10	Jeff Lewis	Associated	Reedy	Reedy/Orion	LRP	Airtronics	RCPS	Losi/Pro-Line

EXPERT STOCK TRUCK

Fin.	Qual.	Name	Chassis	Motor	Battery	ESC	Radio	Body	Tires
1	1	Sohrab Tavakoli	Losi	Peak	Orion	Tekin	Airtronics	Losi	Losi
2	2	Jimmy Babcock	Losi	Maxtec	Ballistic	Novak	Airtronics	Losi	Losi
3	3	Al Mazurkewycz	Losi	Warlock	Racers Edge	Tekin	Airtronics	Losi	Losi
4	5	Kurt Busch	Losi	Precision	Stealth	Novak	Futaba	Losi	Losi/Pro-Line
5	9	Steve Butts	Losi	Extreme	World Class	Tekin	Airtronics	Losi	Losi
6	6	Shawn Dassonville	Associated	Motor Man	Reedy	Novak	Airtronics	Assoc	Pro-Line
7	10	Chuck Erickson	Losi	Extreme	Rossi	Tekin	Airtronics	Losi	Losi
8	7	Cary Bennett	Losi	Peak	Zig	Novak	Airtronics	Losi	Losi
9	8	Justin Morrison	-	-	-	-	-	-	-
10	4	Travis Lawrence	Losi	n/a	Orion	Novak	Airtronics	Losi	Losi

EXPERT MOD TRUCK

Fin.	Qual.	Name	Chassis	Motor	Battery	ESC	Radio	Body	Tires
1	1	Sohrab Tavakoli	Losi	Peak	Orion	Tekin	Airtronics	Losi	Losi
2	3	Curtis Schlaht Jr.	Losi	Peak	Orion	Tekin	Airtronics	Losi	Losi
3	2	Bill Easton	Associated	Reedy	Reedy/Orion	LRP	Airtronics	RCPS	Pro-Line
4	5	John Valentia	Losi	Trinity	Trinity	Novak	JR	Losi	Losi
5	9	Matt Lee	Losi	Maxtec	Badd Boyz	Tekin	Airtronics	Losi	Losi
6	8	Jimmy Babcock	Losi	Maxtec	Ballistic	Novak	Airtronics	Losi	Losi
7	4	Jason Schweitzer	Losi	Scotlers	Maxcell	Novak	JR	Losi	Losi
8	7	Ryan Murray	Losi	Trinity	Trinity	Tekin	Airtronics	Losi	Losi
9	10	Todd Cariseo	Associated	Reedy	Reedy/Orion	Novak	Airtronics	RCPS	Pro-Line
10	6	Colin Macrae	Associated	Reedy	Reedy	Novak	Airtronics	Assoc	Pro-Line



Left to right: Novak can't believe it; Pavidis had to show it!; Furutani and Johnson can't understand it; everyone wants to know who Sohrab Tavakoli is.

Easton's hard work and dedication paid off: he took home the second-place trophy. Al Mazurkewycz made a strong showing and earned the third-place honor.

• Expert Stock Truck.

In the first Main, Sohrab Tavakoli was hardly challenged, and he ended up a full lap ahead of the rest of the pack. In the second Main, Jimmy Babcock gave Tavakoli a run for his money, but Tavakoli hardly broke a sweat and finished a full 5 seconds ahead to win the Expert Stock Truck National Championship. Babcock took the second-place trophy, while Al Mazurkewycz finished third.

• Expert Modified Truck.

At the start of the first Main, TQ Sohrab Tavakoli was railroaded by Curtis Schlaht Jr., Billy Easton and Matt Lee, and he never had a chance to gain a commanding position. His fifth-place finish in the first Main didn't discourage him one bit, and he proved it by blowing their tailgates off in the last two.

Tavakoli won the NORRCA Expert Modified Truck National Championship with a vengeance. Is this guy hot or what! Curtis Schlaht Jr.'s persistent driving style

won him a cool second place, while Billy Easton took home a nice trophy for his third-place finish.

• Expert 4WD Modified.

Throughout the Mains,

two Mains, Mark Pavidis was slightly ahead on points, but Greg Dennett, Brian Kinwald and Barry Baker still had a good shot at the title. In the third Main, Pavidis shot out in front, found a line and said "See ya!" Meanwhile, Dennett and Baker battled

When the points had been tallied, Team Losi had won the Eighth Annual Team Cup Challenge and was declared the best off-road racing team for 1995.

TQ Mark Pavidis was teased by Derek Furutani, Pat Feschtschenko, Matt Lee and Matt Ledger, but his smooth driving put him on top at trophy time. Mark Pavidis added the '95 NORRCA 4WD Modified National Championship trophy to his collection. Derek Furutani took the honorable second-place trophy, while Scott Hughes took home a trophy for his third-place finish.

• Factory 2WD Modified.

During the Mains, Greg Hodapp rose from the dead and took his Maxtec-powered Double-X to victory. Hodapp won the first two Mains, and that gave him a perfect 200 points and the national championship.

Brian Kinwald had to settle for second, while Scott Hughes proudly took third.

• Factory Modified Truck.

After the first

for second. Surprisingly, Kinwald's Double-XT was all over the place and just couldn't find a line. It was pretty obvious that the track's slick surface had taken its toll on Kinwald's bald tires. (During qualifying, Kinwald used two sets of tires and had only one pair left to last the triple A-Mains; see sidebar.) Pavidis won the national championship, while Dennett finished second, and Brian Kinwald rounded up third.

When the points had been tallied, Team Losi had won the Eighth Annual Team Cup Challenge and was declared the best off-road racing team for 1995.

My hat is off to the folks at So Cal R/C Raceway for running a fine race. The 1995 NORRCA Off-Road Nationals was a huge success. Congratulations to Sohrab Tavakoli, Greg Hodapp and Mark Pavidis for all their victories. We also thank these sponsors for all their support: Team Associated, Novak Electronics, Lunsford Racing, RPM, Tekin Electronics, Robinson Racing, Peak Performance, Pro-Line, Dahm's, Kimbrough, Stealth Batteries, Reedy Modifieds, Double Strike Batteries, Maxtec, Twister, Matrix and Tecnacraft. See you next year!

Sportsman

2WD Stock

Fin.	Qual.	Name
1	1	Chris Simpson
2	3	Husani West
3	10	Nick Blais
4	2	Douh Nielson
5	4	David Goss
6	6	Vince Argento
7	7	Lee Erchinger
8	5	Aaron Westin
9	9	Burke Wiedel
10	8	Martin Blais

2WD Mod

Fin.	Qual.	Name
1	1	Chris Simpson
2	2	David Goss
3	3	Erik Vanpelt
4	4	Thunder Wessels
5	6	Lee Erchinger
6	7	Jason Ayers
7	8	Bobby Smith
8	5	Kevin Filippo
9	10	Steven Jackson
10	9	Matt Hayden

Stock Truck

Fin.	Qual.	Name
1	3	Vince Argento
2	6	Don McNamee
3	4	Bill Sipin
4	1	James Livoni
5	9	Aaron Westin
6	5	Todd Amann
7	10	Mike Bauer
8	8	Eric Murray
9	7	Kevin Smith
10	2	Bryan Winberry

Mod Truck

Fin.	Qual.	Name
1	3	Aaron Westin
2	1	James Livoni
3	2	Bill Sipin
4	5	Jason Ayers
5	4	Kevin Smith
6	8	John Connolly
7	9	Kyle Rowland
8	6	Matt Hayden
9	10	Eric Murray
10	7	Daren Martin

Racer information sheets were not available at press time.



TAMIYA

by RICK SCHWARTZ

Championship Series

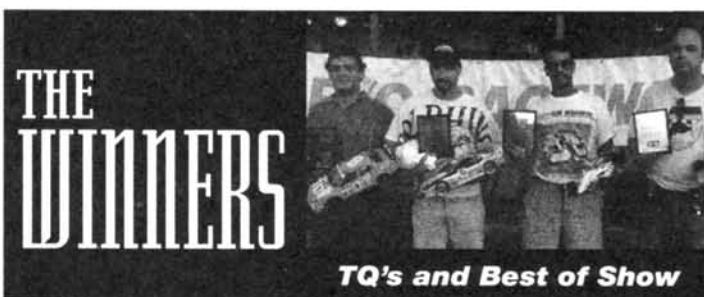
RACE # 9



Slammin' sedan action in turn one.

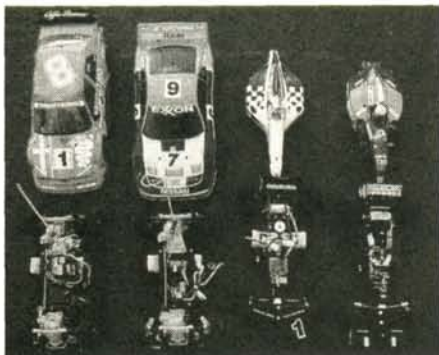
PARKING-LOT racing is coming of age. This was evident at the ninth race of the Tamiya Championship Series in Miami, FL. This event drew quite a crowd, and even though all the entrants seemed serious about racing, their main goal was to have fun. And fun it was. A parking-lot race is probably as much fun as you can have with a transmitter in your hand.

*miami
dice*



THE
WINNERS

TQ's and Best of Show



Left to right: Sedan TQ, Sedan Best of Show, F1 TQ, F1 Best of Show.

THE TRACK

The race, sponsored by Andy's Hobbies, was held at a new track that's run by the Miami R/C Car Club. The site is permanent and was initially designed to handle both 1/10- and 1/8-scale cars. The surface— asphalt with a rubberized top coat—was as smooth as glass and as sticky as glue—the best of all combinations. Maintenance by the club



members kept racing conditions perfect throughout the day.

THE QUALIFIERS

Fifty-two drivers in four classes vied for spots in the A-Mains. The races were 5 minutes long, and in the Stock Class, the cars had to be pure "box" stock. Tamiya's Eric Sands also provided handout batteries for the stock drivers. Entrants in the Modified Class could use any Tamiya hop-up available, but they also had to use the handout battery.



Randy Deppen, racing a FWD Ford Mondeo, drove like a man possessed and won both of his Stock Sedan heats; he took the TQ with 16 laps in 5:02.43. Ed Delgado turned in a blistering 18 laps in 5:05.44 to lead the

pack in Modified Sedan. The top qualifier in F1 Stock was Richard Weeber with 17 laps in 5:00.14. The fastest time of the day was turned in by a Modified F1 car driven by Dave Vera. Dave, who had a different "troll" driver for every race, ran the only 19 laps of the event in 5:09.04.

SEMI-FINISHED

The next hurdle on the way to the A-Main was the semifinals. The top 10 drivers in each class ran a third qualifier. The top five drivers then moved up to the finals. Winning the race didn't really matter—finishing in the top five did. In Formula Stock, number-eight qualifier Eddie Westpy bumped number four Aurelio Caraballo to move on to the finals. Sedan

Stock also had only one change with number-eight Adam Shahan replacing fifth-place qualifier Louis Rodriguez. Mod Sedan and Mod F1 had no upsets. The Mains were set.

A-MAIN ACTION

The atmosphere at the race became a little more serious as the A-Mains began. The trophies and prizes provided by Tamiya were magnificent. First place in each class won a 1/10-scale Tamiya car kit; everyone wanted to go home with one of those. To make things more interesting, Stock and Modified were combined for the Mains. The mod drivers moaned and groaned about the possibility that the stock drivers would slow them down (but you know how mod drivers complain).

F1 Mod—Dave Vera continued to be the best of his class; he won the overall race



The Miami R/C Car Club's track is a permanent facility that was designed for 1/10- and 1/8-scale gas cars.

with 18 laps in 5:06.85. Andres Garrido placed second, and David Meeker was third to round out the Mod class.

F1 Stock—David Franklin battled with TQ Richard Weeber the entire race; Franklin won by 18/100 of a second—17/5:14.08 to Weeber's 17/5:14.26. Kenneth King was third with 17/5:15.98.



Sedan Mod—TQ Ed Delgado's 4WD Alfa Romeo won with 18 laps in 5:10.90. I took the second spot with my FWD Renault Clio Williams, and the third spot was nabbed by Mike Contreras.

Sedan Stock—TQ Randy Deppen pushed his machine to the limit; he won the Stock Class and blasted past three mod drivers to finish third overall with 17 laps in 5:16.95. Second-place Stock went to Jack Acosta, with Adam Shahan finishing third.

AS THE SUN SETS IN THE WEST

Hats off to Tamiya's Eric Sands, Andy's Hobbies' Pat Butler and the Miami R/C Car Club. The race was a blast and was well-organized; every racer I talked to had fun! These guys made a true convert out of me! Parking-lot racing is here to stay; it's a new R/C class to be reckoned with. ■



TRINITY* HAS ALWAYS been on the cutting edge of stock motor technology. In the late

'80s, they released the Monster Horsepower stock motor, which was then the hottest available stocker.

As time went by, Trinity continually released new stock motors that eclipsed their predecessors by using state-of-the-art technology—new motor-can designs and thicknesses, more powerful magnets and innovative commutator designs.

We're now used to seeing these impressive Trinity motors—most recently, the Slot Machine 2 (SM2) and the Green Machine 2 (GM2). The GM2 and the SM2 are currently the most powerful 24-degree stock motors on the market today regardless of brand. We wanted to compare the performance of Trinity's new Midnight with the current champs. As you'll see from the results of our tests, Trinity has once again found a way to extract even more power from a stocker.



A stock motor
with bite!

TRINITY

Here's Trinity's latest stock motor—the Midnight. According to early test data, it's now the most powerful, 24-degree, ROAR-legal stock motor available. Let's see what it has that other stockers don't have.

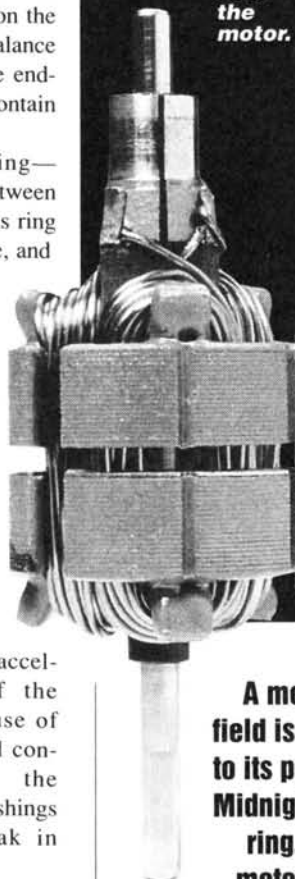
- **Internal magnetic flux collector.** A motor's magnetic field is vitally important to its performance, and the motor can shape and contains the magnetic field. But a can is shaped like a cup; it's open on the top, and this opening creates an imbalance in the magnetic field because, on the endbell side, there's no can material to contain the field.

The Midnight has a metallic ring—called a Magnetic Flux Collector—between the motor's endbell and magnets. This ring improves the magnetic field's balance, and this makes the motor more powerful.

- **Narrow-cross-section bushings.** On the Midnight, the bushings (see below) are counter-bored on one side to significantly reduce (by about a third) the bushing area that contacts the armature shaft. This allows the armature to spin with much less friction than those of other motors with standard bushings. This means higher rpm and quicker acceleration off the line. Because of this reduced contact area, the Midnight's bushings will also break in more quickly.

- **Short-stack, dual-rotor, slotted armature with thermal-transfer gateways.** This all-new armature is similar to the one that was previously used in the NORRCA-legal Monster Horsepower Jr. 2 36-degree

The Midnight's armature resembles the one that was used in the NORRCA-legal Monster Horsepower Jr. 2 36-degree stock motor. Look closely at the top and bottom of the armature stack, and you'll see the aluminum heat sinks that help cool the motor.



A motor's magnetic field is vitally important to its performance...The Midnight has a metallic ring...between the motor's endbell and magnets. This ring improves the magnetic field's balance, and this makes the motor more powerful.

DYNO DYNAMICS

These tests were done on a Competition Electronics* TurboDyno 45. All the motors were fitted with Trinity RC-4384 slotted laydown brushes; springs were stock, as supplied with the motors.

SLOT MACHINE 2

Amps	Rpm	Torque	Watts	Efficiency (%)
10.0	22,637	1.3	22	37
14.9	18,998	4.2	60	67
20.0	16,339	6.7	82	67
24.9	14,359	9.0	96	65
30.0	12,583	11.1	103	57
34.9	10,752	12.7	101	48

GREEN MACHINE 2

Amps	Rpm	Torque	Watts	Efficiency (%)
10.0	21,879	1.4	23	38
14.9	18,505	4.4	60	67
20.0	16,122	6.9	82	67
24.9	14,224	9.1	96	64
30.0	12,429	11.3	104	57
34.9	10,636	13.1	103	49

MIDNIGHT

Amps	Rpm	Torque	Watts	Efficiency (%)
10.0	22,312	1.4	24	39
14.9	19,244	4.3	61	68
20.0	16,342	6.9	83	69
24.9	14,517	9.2	99	66
30.0	12,872	11.3	107	59
34.9	11,025	13.0	106	50

stock motor. The Midnight's Thermal Transfer Gateway is actually an innovative heat-sink system that cools the armature windings.

A pair of three-pole aluminum heat sinks—one at each end of the armature stack—help pull heat away from the copper armature wire. The wire is wound around each armature "pole" and also around a portion of a heat sink. As a result, the motor stays cooler, and that means consistent power and longer run times.

MIDNIGHT

by John Howell

TRINITY MIDNIGHT

- **1.3mm-thick can with 5.2 wet magnets and cooling tunnels.** This thicker can/magnet combo is the one Trinity uses in their Team Kinwald Modified Motors, making the Midnight the first stock motor to have a modified-motor can. The can's thickness and the 5.2 magnets improve the motor's magnetic field so that the motor generates more power, runs cooler and lasts longer. Both features have worked well on modified motors and should prove to be very effective here. The cooling tunnels help air circulate through the motor.

- **Advanced air-vent system.** This allows air to circulate freely through the can but keeps the integrity of the motor's magnetic field almost intact.

MORE STANDARD FEATURES

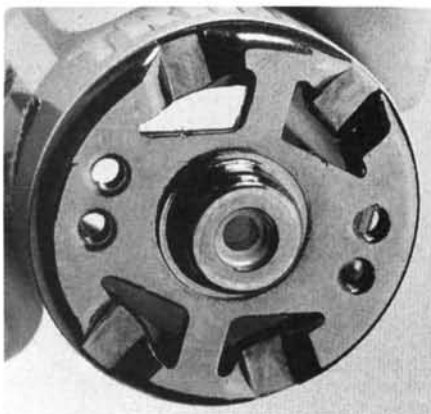
- **UniFlow endbell.** The Midnight uses the UniFlow endbell that's found on the GM2. It's lighter, and it has specially designed cooling fins and Trinity's laydown brush system. The brushes are held by high-tension, temperature-resistant BlackTek motor springs, which won't lose their tension if you accidentally overheat the motor.

- **Trinity RC-4463 hard-compound brushes and soldered-on capacitor.** The Midnight has Trinity's popular RC-4463 hard-compound brush soldered in at the factory and so is a noise-suppression capacitor. Like the Green Machine 2, this motor is ready to run, right out of the box.

- **Hand-assembled.** Every Midnight stock motor is assembled by hand and then tested



You'll find the Green Machine 2's UniFlow endbell on the Midnight, too. It's very light and cools more effectively than previous designs.



The Midnight is the first stock motor to use a modified motor can. The can is thicker than those used by most stock motors, and it also features stronger, 5.2 magnets. Narrow-cross-section bushings reduce the armature/bushing contact area by about one third, and that helps to reduce friction.

to see that it runs properly.

This is all fine and dandy, but is the Midnight faster than the Green Machine 2 and the Slot Machine 2?—Trinity's other top-of-the-line stockers. Check the charts that show what the dyno revealed.

THE CHARTS SHOW...

As you can see, in rpm and power, the Midnight has an edge over both the GM2 and the SM2. While talking with Trinity's Neal McCurdy, I learned that this motor was initially designed to be a replacement for the SM2, but as you can see from the dyno results, the Midnight also outperforms the GM2 by a fairly big margin.

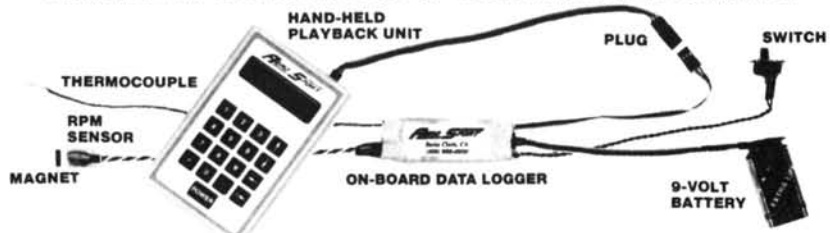
The Midnight was only beaten on the dyno once—by the SM2 at the 10A setting; the SM2 turned 22,637rpm to the Midnight's 22,312. Neal told me that the SM2 beat the Midnight at the lower amp setting because of the long slot in the SM2's can. Apparently, this slot allows the SM2 to rev up faster initially than the Midnight. As you can see on the chart though, once over the 10A mark, the Midnight starts to pull away from the SM2.

So what does this all mean? Well, if you're a diehard stock-class racer, you'd better pick up one of these motors before your competitors do. If they have them and you don't, you'll be bummin'—or, at least, slower....

*Addresses are listed alphabetically in the Index of Manufacturers on page 176.



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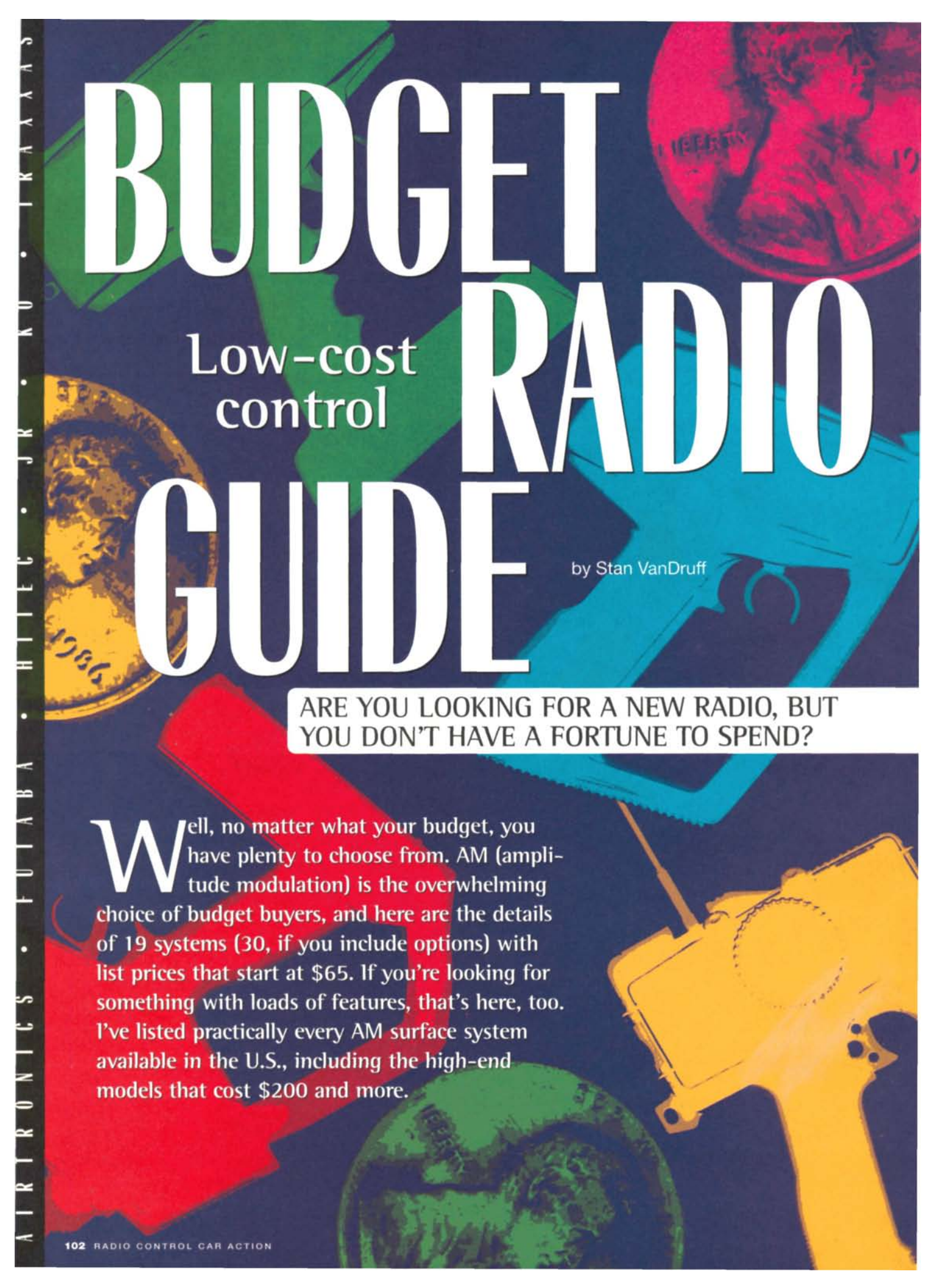
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BUDGET RADIO GUIDE

Low-cost control

by Stan VanDruff



ARE YOU LOOKING FOR A NEW RADIO, BUT YOU DON'T HAVE A FORTUNE TO SPEND?

Well, no matter what your budget, you have plenty to choose from. AM (amplitude modulation) is the overwhelming choice of budget buyers, and here are the details of 19 systems (30, if you include options) with list prices that start at \$65. If you're looking for something with loads of features, that's here, too. I've listed practically every AM surface system available in the U.S., including the high-end models that cost \$200 and more.

FUTABA



ATTACK II/2CR



ATTACK SR/2VR



MAGNUM SPORT



MAGNUM JUNIOR



MAGNUM AM

Futaba* offers two inexpensive stick models. The Attack II is for youngsters or someone who just wants to wet his toes in R/C. Those who expect to stick with R/C for a while would do better to choose the Attack SR. Futaba also offers the widest range of AM pistol-grip radios from the Magnum Junior to the flashy (and expensive) Magnum AM. All Futaba pistol-grip models come with a reliable analog battery meter.

■ **Attack II/2CR**—a lightweight, inexpensive radio that will show up in many kits. Special manufacturing techniques have brought the production cost of the transmitter, receiver and servo as low as it could possibly be, but this system has little to offer as far as features go.

■ **Attack SR/2VR**—a bit more serious than the Attack II. Though it costs only \$15 more than the Attack II, the SR also has servo-reversing, aluminum sticks, and a low-battery-warning beeper. It also looks and feels more like a more expensive radio.

■ **Magnum Sport**—an entry-level pistol radio that has been included in thousands of Futaba kits. It has a comfortable, friendly feel and an easy-to-reach trigger and soft-rubber wheel. The antenna sticks up rather high where it can be broken, but it can be unscrewed and stowed in clips on top of the body.

■ **Magnum Junior**—can easily be confused with the Sport. It has the same case, but adds controls for high and low throttle end-point adjustments. Dual-rate steering is standard, and, with the thumb wheel, is easy to adjust, even while driving.

■ **Magnum AM**—the most feature-rich AM model available. It has the same exotic case as the Magnum PCM radio; it keeps the special trim functions under a clear-plastic cover. Distinctive features include throttle and steering sub-trim, and throttle and steering high/low end-point adjustments. Its wide wrist strap helps you balance the radio's unusually weighted case. It even comes with a small, clip-on screwdriver for adjusting the tiny trim pots. All the usual trim functions, including a separate brake limiter, are easy to adjust while you're driving. For all its features, it should come with a better manual.

HITEC/RCD

All Hitec/RCD* surface radios are AM, and they're undeniably low-budget models; these three entries are the least expensive radios here. Even so, they all include servo-reversing, Ni-Cd charging jacks and battery meters.

■ **Challenger 250**—Hitec's no-frills Challenger 250 is the least expensive radio in this roundup. It features servo-reversing and a low-battery warning, but its styling is homely at best.

■ **Ranger 2S**—The Hitec Ranger 2S is styled like a high-tech aircraft radio. Its circuit boards use state-of-the-art, surface-mounted technology and fully automated assembly to produce a high-quality radio at an unusually low price. Its

features include adjustable spring tension on the sticks and two-position neutral on the throttle stick.



CHALLENGER 250



RANGER 2S



CHALLENGER 260

■ **Challenger 260**—the least expensive pistol-grip radio here, the Challenger 260 was designed for beginners. Other radio makers caution against turning the wheel too far, but the Challenger 260 has a patented, anti-breaking wheel that slips if you turn it too far in the excitement of a race. It also features a unique, variable, throttle/brake ratio and has adjustable wheel tension as well as servo-reversing. For such an inexpensive radio, it's packed with features.

At club meetings, in magazines—even on the Internet—you hear a lot of talk about AM versus FM radios (amplitude modulation versus frequency modulation). Some think that if you use an AM radio, you're a novice. They say that if you're serious, you buy FM. Are they right? Well, the truth is that a well-made AM system is just as capable as an FM system. Unlike R/C pilots, R/C car drivers keep their cars within 200 feet of the transmitter. At these distances, FM just isn't as important; and if your radio does glitch, there's little risk that your car will fly into a tree. Around 90 percent of all surface systems are

Why Not FM?

AM; some manufacturers don't even offer FM surface radios. It should be obvious that manufacturers don't think AM is for novices either. JR's AM receivers, for example, use the same ABC & W circuitry as their FM models for excellent selectivity. Airtronics, Futaba and JR make AM transmitters with enough fancy features to befuddle an engineer.

FM is not a gimmick. It's invaluable for R/C aircraft pilots and for competing, when radio glitching is a problem. But for most of us, an AM radio is perfect.

TERMS USED IN CHART

• **Channels.** R/C cars need two channels—one for steering and the other for throttle. The KO Propo radio has a third channel that's simply on/off. It can be used to control auxiliary lights or to operate a remote starter for a gas car.

• **Stick/wheel.** The least expensive radios have two joysticks to control throttle and steering: the left stick moves up/down for throttle and the right stick moves left/right for steering. Wheel-type transmitters have a pistol grip and use a small wheel for steering and a trigger for throttle. Wheel radios are popular choices for driving R/C cars and boats.

• **Servo-reverse.** A switch on the transmitter causes the servo to reverse its normal operation. Why? So you can mount the servo in a way that's convenient without worrying about which way it turns.

• **EPA/ATV—steering and throttle.** Endpoint adjustment/adjustable travel volume: this allows you to adjust the angle at which the servo will stop when the wheel is turned as far as it will go to the left or to the right. It prevents the linkage from binding, and it makes the car easier to handle though less responsive. EPA/ATV has a similar effect on the throttle.

• **Trim—steering and throttle.** This allows the neutral point for the steering and throttle servos

to be electronically adjusted. It prevents your car from drifting to one side and allows it to sit still when the throttle is at neutral.

• **Dual-rate—steering.** True dual rate means that the servo response varies according to its angle. Dual rate in this application is actually an adjustable single rate that varies the sensitivity of the steering servo. In plain English: it has EPA adjustment that affects both right and left to make the steering more or less responsive.

• **Wheel/stick tension adjustment.** Allows you to adjust the steering wheel or joystick spring that pulls the control back to the neutral position. Stiff settings make your returns quicker, but they may tire your hand muscles.

• **Adjustable neutral—throttle.** Throttle adjustment that lets you select from 50 percent throttle/50 percent brake (1:1) to 75 percent/25 percent (3:1). Most drivers seldom use brake, so setting the neutral at 3:1 gives the driver finer control over the throttle.

• **Battery meter.** Usually an analog (needle-type) meter, or a series of light-emitting diodes (LEDs) that indicate the charge left in the transmitter batteries.

• **Low-battery warning.** A beeper or a flashing LED that warns you that your transmitter battery is getting dangerously weak.

• **Ni-Cd charge jack.** A connector that allows you to recharge Ni-Cd batteries while they're still in the transmitter.

• **BEC—battery-eliminator circuitry.** Allows the receiver to operate off the Ni-Cd battery that also powers the motor (on electric cars); eliminates the need for the 4-cell receiver battery.

• **Left-handed available.** To my knowledge, no manufacturer makes transmitters designed specifically for left-handed drivers. Several models do have reversible handles that allow lefties to use them comfortably. Stick models can only be reversed by opening the radio and swapping the gimballs.

• **Fail-safe.** Available only on PCM models. When the receiver loses its signal, it goes to a preset position that usually brings throttle to neutral to prevent a "runaway"; very useful with gas cars.

• **Frequency band.** Surface radios (cars and boats) can operate on two bands: 27MHz (channels 1 through 6) and 75MHz (channels 61 through 90). When you buy a radio, you have to decide which of these bands you want to use.

• **Warranty.** How long the manufacturer promises the radio will work properly, or they will fix it for free.

TRAXXAS



■ Pistol Radio System.

Traxxas* offers a good, uncomplicated, entry-level radio system that's great for first-time users and reversible for left-handers. It has servo-reversing, but it's the only radio here without a battery meter, and it puts out the maximum allowable 750mW. Although it has the shortest warranty—30 days—Traxxas offers an extended-warranty plan that means you'll never have to pay more than \$20 to have your radio repaired. (With another brand of radio, I've paid \$25 just to have the receiver adjusted by its manufacturer.)

AIRTRONICS

FUTABA

	Avenger 2S	Avenger 2R	Rival Sport	Rival 2P	XL2P	Attack II/2CR	Attack SR/2VR	Magnum Sport	Magnum Junior
Channels	2	2	2	2	2	2	2	2	2
Stick/Wheel	Stick	Stick	Wheel	Wheel	Wheel	Stick	Stick	Wheel	Wheel
Adjustable neutral (throttle)	No	No	2:1 / 1:1	2:1 / 1:1	2:1 / 1:1	No	No	2:1 / 1:1	2:1 / 1:1
Battery meter	3 LEDs	3 LEDs	3 LEDs	3 LEDs	Analog	2 LEDs	4 LEDs	Analog	Analog
Left-handed available	No	No	No	No	Reversible	No	No	No	No
Power supply	8 AA	8 AA	8 AA	8 AA	8 AA	8 AA	8 AA	8 AA	8 AA
Frequency band (mHz)	27/75	27/75	27/75	27/75	27/75	75	75	27/75	27/75
Warranty	1 yr.	1 yr.	1 yr.	1 yr.	1 yr.	1 yr.	1 yr.	1 yr.	1 yr.
Servo reverse (throttle)	No	■	■	■	■	■	■	■	■
Servo reverse (steering)	No	■	■	■	■	■	■	■	■
EPA / ATV (throttle)	No	No	No	No	■	No	No	No	■
EPA / ATV (steering)	No	No	No	No	No	No	No	No	No
Trim (steering)	■	■	■	■	■	■	■	■	■
Trim (throttle)	■	■	■	■	■	■	■	■	■
Dual rate (steering)	No	No	No	■	■	No	No	No	■
Wheel /stick tension adjustment	No	No	No	No	■	No	■	No	■
Low-battery warning	No	No	No	■	No	No	■	No	No
Ni-Cd charge jack	■	■	■	■	■	No	No	No	■
BEC	■	■	■	■	■	■	■	■	■
Fail-safe	No	No	No	No	No	No	No	No	No
List prices	\$89.95	\$109.95	\$129.95	\$149.95	\$169.95	\$94.95	\$109.95	\$134.95	\$179.95
Discount prices (estimates)	\$51.99	\$62.99	\$59.99	\$69.99	\$84.99	\$45.99	\$54.99	\$61.99	\$84.99

* Not an electronic adjustment, but limits how far you can turn the wheel

JR* is well-known for its comfortably shaped transmitter cases. Their Beat Gear and Python radios are excellent examples of good ergonomic design. They feel comfortable in your hands, but don't look like something from an alien planet. JR's Alpina models are also quite comfortable and laden with features; for example, the Alpina PCM is the only radio on the market with AM pulse-code modulation, so it's the least expensive way to get the fail-safe feature you need for gas cars and trucks. JR transmitters put out 750mW (the maximum allowed by the FCC), and their receivers feature patented anti-blocking, cross-modulation and window circuitry to reject unwanted signals and noise.

■ **Beat Gear**—a fine example of an ergonomic case style that combines comfort with a new "organic" look. All controls and trims are on the front of the case where they're easy to reach. Even the crystal is mounted up front so you can easily see which frequency you're using. At 750mW, the Beat is the most powerful stick radio here.

■ **Python.** According to JR, the Python

will put a squeeze on the competition, but *you'll* want to squeeze its comfortable, pistol-grip handle. Its dual-rate-steering thumb wheel is ideally positioned for easy access while you're driving; the other controls are almost as conveniently placed. Batteries just drop into the handle, so you don't have to mess with a separate battery holder.

■ **Alpina**—has more features than all other AM radios except the Futaba Magnum AM. It's well-balanced, and the controls are conveniently located on the front. Important controls, such as dual rate, can be adjusted while driving. My only complaint is about the steering wheel's hard texture.

■ **Alpina PCM**—the only AM PCM radio in production, the Alpina PCM is therefore the only AM radio to offer fail-safe operation. Perfect for use with gas cars, fail-safe will return the throttle to neu-



BEAT GEAR



ALPINA



PYTHON



ALPINA PCM

tral if the receiver loses contact with the transmitter. It isn't uncommon to see a gas car take off for the next county when a driver forgets to turn on the transmitter, or the batteries dump. The Alpina PCM has plenty of other features, but it gives up the throttle and steering endpoint adjustments to make room for the fail-safe switches.

HITEC

JR

KO

TRAXXAS

Magnum AM	Challenger 250	Ranger 2S	Challenger 260	Beat Gear	Python	Alpina AM	Alpina PCM	EX-3	Traxxas
2	2	2	2	2	2	2	2	3	2
Wheel	Stick	Stick	Wheel	Stick	Wheel	Wheel	Wheel	Wheel	Wheel
2:1 / 1:1	3:1 / 1:1	3:1 / 1:1	Variable	3:1 / 1:1	No	No	3:1 / 1:1	2:1 / 1:1	1:0 / 3:1 / 1:1
Analog	3 LEDs	3 LEDs	3 LEDs	Analog	Analog	Analog	Analog	Analog	None
No	No	No	Reversible	No	No	No	No	No	Reversible
8 AA	8 AA	8 AA	8 AA	8 AA	8 AA	8 AA	8 AA	8 AA	8 AA
27/75	27/75	27/75	27/75	27/75	27/75	27/75	27/75	27	27
1 yr.	1 yr.	1 yr.	1 yr.	1 yr.	1 yr.	1 yr.	1 yr.	1 yr.	30 days
■	■	■	■	■	■	■	■	■	■
■	■	■	■	■	■	■	■	■	■*
■	No	No	No	No	No	■	No	■	No
■	No	No	No	No	No	■	No	■	■
■	■	■	■	■	■	■	■	■	■
■	■	■	■	■	■	■	■	■	■
■	No	No	No	No	■	■	■	■	No
■	■	■	■	No	No	■	■	■	No
■	■	■	■	No	No	No	No	No	■
■	■	■	■	■	■	■	■	■	No
■	■	■	■	■	■	■	■	■	■
No	No	No	No	No	No	No	■	No	No
\$319.95	\$65.95	\$71.95	\$76.95	\$99.95	\$99.95	\$119.99	\$139.95	\$219.99	\$99.95
\$179.99	\$44.99	\$54.99	\$52.99	\$79.99	\$79.99	\$99.99	\$109.99	\$149.99	\$64.99

AIRTRONICS



AVENGER 2R



RIVAL



XL2P

All the Airtronics* transmitters reviewed here have their plug-in crystal mounted on the front of the case so that you can quickly see which channel you are on. Stick models feature built-in handles and wide feet that prevent them from tipping over on the bench. Pistol-grip models are comfortable to hold and are available with electronic speed control (ESC).

■ **Avenger 2S and Avenger 2R**—Airtronics' low-budget entries. The 2S is a barebones model, but it includes nice features such as an LED battery meter, an easy-to-access crystal and a charging jack for optional Ni-Cds. For an additional \$10, the Avenger 2R has the addition of highly desirable servo-reverse switches.

■ **Rival Sport and Rival 2P**—nicely styled pistol-grip transmitters with a comfort-

able, bottom-heavy feel. Their antennas completely retract into their handles, and a protective cover slides over them. Both models sport a unique, coarsely textured wheel and easy-to-reach trim knobs. For a few extra dollars, the Rival 2P has servo-reversing and dual-rate steering control. In addition, the 2P has an audible low-voltage alarm.

■ **XL2P**—an upscale, pistol-grip radio with in-handle batteries and a low steering wheel that give the transmitter a unique, well-balanced feel. It has high and low endpoint adjustment for the throttle, but none for steering. It also has a unique, thumb-activated "panic" brake. At first, this seemed like an unnecessary frill, but it could be an advantage to those of us who have a hard time reaching the brake with our index finger.

KO PROPO



EX-3

■ **EX-3**—the only 3-channel system here, but its third channel is on/off instead of proportional. The third channel can be used for an onboard starter (which KO Propo* also makes) or for turning lights on and off. Otherwise, the EX-3 is a well-balanced, comfortable radio that has all of its features arranged in a logical, user-friendly manner. Most trim functions are enclosed behind a smoked plastic cover to prevent them from being accidentally altered.

**Addresses are listed alphabetically in the Index of Manufacturers on page 176.*



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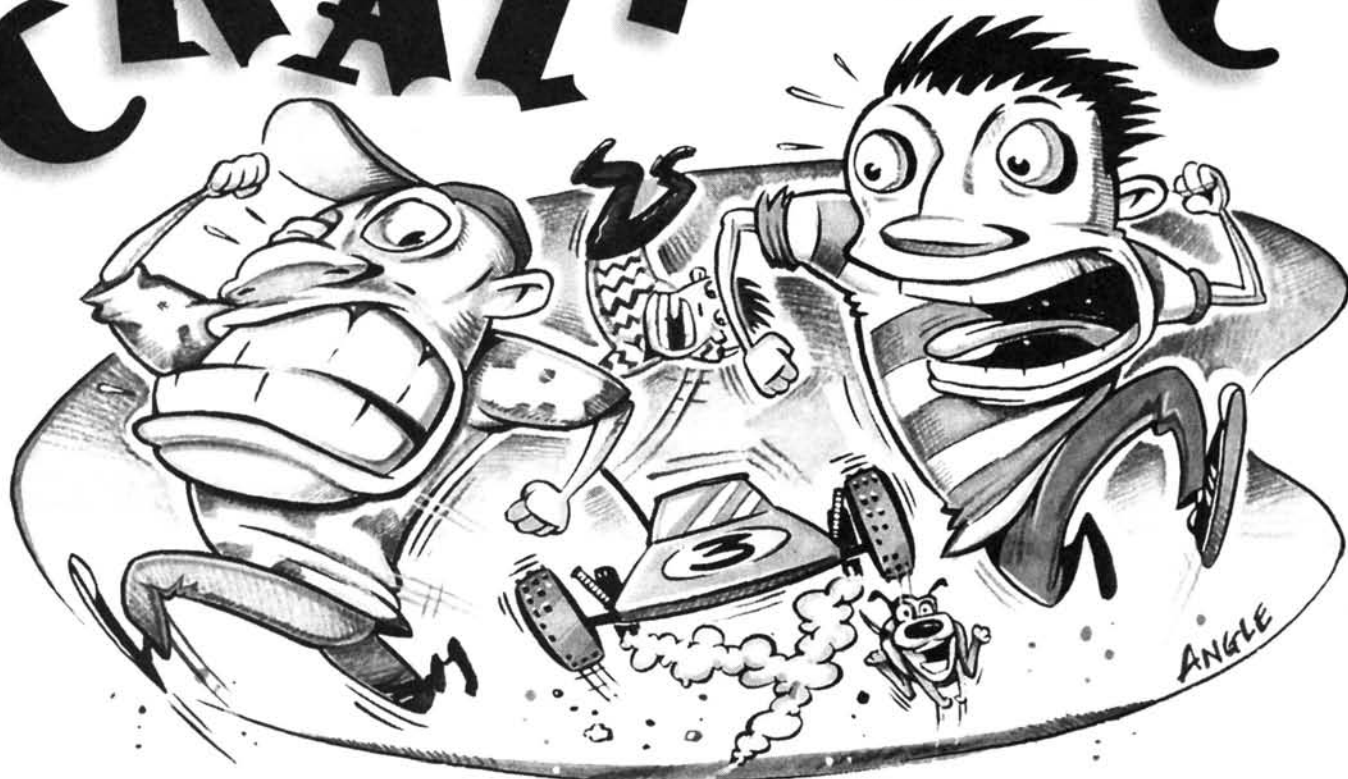
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CRAZY R/C



AT ONE TIME OR ANOTHER, we've all had some crazy experiences in this R/C hobby of ours. For instance, have you or someone you know ever wired a motor in backward right before the start of a race? It's a pretty funny scene when someone punches the throttle, roosts backwards, and the car takes out the people behind it like a bowling ball crashing into a set of pins. How about this one: have you ever seen someone lose control of an $\frac{1}{8}$ -scale gas car that's doing 50mph+ right in front of a busy street? Ouch! Well, we the editors have compiled some pretty funny R/C stories (some are definitely a little wackier than others), and we thought we'd pass them along to you, our readers—enjoy!

ILLUSTRATION BY SCOTT ANGLE

PICNIC PANDEMONIUM

Some of the funniest, craziest R/C antics that I remember have happened while I was out covering races. For some reason, when you get to a major event where there's a ton of pressure on the racers, something out of the ordinary is bound to happen.

One of the funniest things I've ever seen was at the first gas race I ever went to. It was an $\frac{1}{8}$ -scale off-road gas race in Detroit, MI, and it was also the first time I saw how fast $\frac{1}{8}$ -scale gas cars can really go. Now, to set the stage, you have to imagine the site of the race. The track is right in the middle of a public park. There are basketball courts, an outdoor pavilion, plus a wide-open area for picnics. Well, here we are out in the middle of all this with 4WD off-road gas cars, which weigh in at around 7 or 8 pounds and are capable of 45 to 50mph. If one were to go out of control, it would be a pretty psycho scene, and man, did we have a scare that day.

It was either during one of the qualifiers or the actual races, when someone's car got stuck wide-open and blasted off the track. Usually, the cars can't go too far because there's a fence around the perimeter of the track. Well, this car must have hit a jump just

right because it cleared the perimeter fence and hit the ground screamin'!

For a second, we all just stared at it stupidly as it took off away from the track, then we looked ahead of it, and suddenly realized that it was headed wide-open toward a huge company picnic. We were horrified!

Luckily, these three guys started a hot pursuit about 100 yards behind the car, sprinting as fast as they possibly could, chasing down the land-based, nitro-powered torpedo. The car, which at this point was barreling down on the group of people, was tapped out at full speed. Then, all of a sudden, the car hit a hole in the ground, bounced up in the air, did a complete 180-degree turn and started heading toward the three guys chasing it at full speed. It was like a scene out of the "Three Stooges!" The three guys did an abrupt "about face" as the car started chasing *them*! We all started cracking up for a second, then realized it was now headed straight for *us* at top speed! It got pretty close to the track, then hit another hole and sped off into a nearby chain-link fence. It was scary, but funny at the same time.

—John "Doogie" Howell

IT'S TIME TO SHARE

My other most memorable, crazy R/C scene was at another gas race that was held in King, NC. There were these two local racing buddies who were pretty much racing identical looking buggies. Both guys went out in the same qualifier, and they were just hacking everyone. Everyone standing around the track was getting a big kick out of watching the two of them slam into everyone out on the track. All of a sudden, one of the "terrible two" launches his car off this huge jump, and it sails right off the track, into the woods, and it takes off. Naturally, I looked up at the drivers' stand expecting to see a pained expression on his face, but there he was, concentrating intensely, still driving his car (or so he thought). I had no idea what was going on until I looked over a couple of places on the driver's stand at his buddy, and saw that they were both attempting to drive the same car! I pointed it out to a couple of the racers near me, and they started rolling on the ground laughing. It wasn't until the qualifier was over that the one guy realized what had happened after they both tried to pick up the same car. It was definitely a funny scene.

—John "Doogie" Howell

STORIES

IN A STICKY SITUATION

With all the serious preparation that goes into racing, there must be some way to let off steam and have fun at the track. Some friends of mine and I used to go to a track behind a high school that offered some pretty fierce competition, yet was still laid-back enough to be relaxing. One day, we were there to do battle with a bunch of buddies as we did every weekend. Racing was good, but my friend Steve Pond and I wanted to liven things up a bit and have some fun. Steve grabbed a large bottle of CA and kicker, and we headed toward the drivers' stand.

Mike Paganelli (a.k.a. Mad Mike Pags) had the misfortune of being on the stand at this moment. His heat was just about to start racing, and his car was on the track. I got on the stand with the CA and stood right behind Mike; Steve stayed on the ground but positioned himself near Mike's feet. As the race got underway, I started to put CA around the soles of his sneakers. I applied a very liberal

dose of the medium stuff around the perimeter of his feet until I was satisfied with the coverage. Mike was doing well in the race and was shifting his feet a little as he drove. This was causing the glue to work its way under the soles. A minute later, Steve began hitting the shoes with kicker to solidify the glue. We then sat there waiting for the fun to begin.

At the 3-minute mark, Mike was still racing and had no idea what we had done. He was racing; we were holding back our laughter. Then it happened: he crashed. He yelled to the marshal and tried to jump up in frustration at his mistake. He tried, but the glue had completely cemented both feet to the stand, and he began to realize that something was up. Steve and I were laughing, and the rest of the people at the track were starting to catch on.

Mike is a big guy, so even super glue won't stop him from doing something if he really wants to. The first jump caused him to lose his balance

a little, and he had to grab the railing in front of him to keep from falling over. The next time he tried to move his feet, he tried a little harder and managed to get one foot free. The only problem was that part of his shoe was still stuck to the stand. Now he knew that something was going on, but he still had to race. Some of the glue was still wet underneath his shoe so, even though he moved it, it still stuck pretty well. He finished the race and looked down at his feet. He pulled and twisted and, after a few minutes, managed to get his feet free from the stand, though there was still some rubber stuck to the stand. By this time, the crowd was going wild, and Steve and I had distanced ourselves to keep clear of Mad Mike. He was a good sport and laughed along with the rest of us. Luckily, the sneakers were already shot before we got to them.

—John Huber

A TEST OF ENDURANCE

Our local off-road track had decided to put on a team endurance race. The competing teams were made up of three drivers—each of whom was required to drive his own car. I knew that I wanted to team up with my buddy Bruce, as he was one of the fastest racers around. Bruce seemed as eager to team with me, *provided* that we include his friend Dickie as the third member. "Sure thing," I said. I would live to regret it!

As it turned out, Dickie was a pretty good driver, but he had this thing about his cars. "Retro" is the best word for it. Dickie's car of choice was a vintage Tamiya Super Champ—the one with the weird trailing-arm front suspension, die-cast rear arms that cause bizarre camber changes, and that big ol' shock reservoir thing in the back. I had seen Dickie's ride before, and he was pretty fast with it. Normally, Dickie's body of choice was the front half of an 1/8-scale Chevy Monza—from the firewall back. This was around '85, so I guess you could say that Dickie predicted the whole minivan craze!

Come race day, however, Dickie showed up with a *new* body that he'd painted just for the race; the biggest, floppiest, '55 Chevy body I had ever seen! Bruce and I exchanged a worried glance but, hey, how bad could it be? Besides, how could we break poor Dickie's heart?

Bruce and I were going fast and, at first, we thought our team would win. Unfortunately, Dickie had other plans. Every time it was on the track, Dickie's car would dump, and it would do so at the farthest spot on the track away from the pit area. When it wasn't dumping, Dickie's massive, '55 Chevy-bodied dinosaur would flop, scrape and "ka-jong" its way around the track, turning in the slowest lap times on record.

When it was all over, Dickie came off the drivers' stand and greeted us with a big smile. "Man, that sure was fun!" We ended up finishing second—not bad, and neither Bruce nor I could actually get mad at Dickie. Watching his car on the track was a lot of fun, too!

—Frank Masi

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CRAZY R/C STORIES

IT'S ALL IN THE SETUP

My friend Dave was having a really bad day. A bunch of us were at an off-road race in southern New Jersey, and Dave was struggling with the track's rough, bumpy surface. The best he could muster was a D-Main qualifying position, and he was really down in the dumps. Being sensitive individuals, we decided to play a little joke on Dave during his Main.



Before the start of the D-Main, we told Dave that the race director wanted to see him about changing frequencies. While he was gone, we completely "re-tuned" Dave's RC10 for him. We cranked down on the car's left-side shock-spring collars and raised the ones on the right side, so that the car had a serious starboard-side list. Then, we took an X-Acto knife and sawed halfway through each ball cup. Finally, we tightened down on the right front wheel nut so that the wheel wouldn't even rotate!

Dave finally came back and, of course, we graciously offered to place his car on the starting line for him. In theory, at the start of the race, Dave's car (which was placed on the front row of the grid, toward the left side of the track) would veer dramatically to the right, effectively taking out the rest of the field making Dave a serious "hammer."

At the horn, Dave proceeded to *holeshot* the entire field!

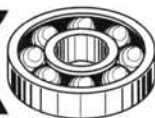
"What happened?" I asked, turning to my friend Dan.

"All right, just wait..." he said, "...one of those ball cups is bound to break."

Guess what? We waited...and waited—nothing! Dave finished the entire race, won the Main and turned in his best time of the day! We never told him. —Frank Masi

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Over 100 gas racers do ba



Art Carbonell (right) dominated two classes at the Biggie.

by CHRIS BRAME

For the last 18 years, the Texas Biggie 1/8-scale gas-car races have drawn many top racers, including former world champions, national champions and international drivers from around the world. This year, the event was used as a warm-up race for those racers who would go on to participate in the IFMAR 1/8-scale Worlds in Thailand.

THE CLUB

The Dallas RCRC Club and Speedline hosted this year's race at the RCRC track in Dallas—one of the premier permanent tracks in the U.S. The surface is absolutely flat and extremely smooth. The bite is outstanding and, best of all, there's very little tire wear. If you're lucky enough not to chunk a set of tires, you could run the same set all weekend! More than 115 drivers took part in the race that included many top drivers from Serpent, BMT, Delta, Parsec and PB. The club did an outstanding job of running the race. The most noticeable absence was Ron Paris and Team Picco/Paris.

QUALIFYING

Six rounds of qualifying took place on Saturday and Sunday. If you had six bad rounds of qualifying, you could still make the A-Main. This year, a "bump-up" system was used, and those who won their Main could bump up to the next Main. Even if you made the F-Main, with a little luck and a lot of racing, you could bump-up and make the A-Main.

- **1/10-Scale Qualifying.** It was clear that the new Serpent Impact Pro 2 would be competitive right out of the box. Art Carbonell's Impact and Dave Campbell's Delta Fireball battled it out for the TQ in the 1/10-scale class. In the end, Campbell claimed the TQ with 19/5:05.12, and Carbonell grabbed the next spot only .17 second back—talk about transponder placement in the car. Don Jones's Impact rounded out the top three 8.07 seconds behind second. The A-Main was set with four Serpents, three BMTs, two Deltas and one PB. It should be noted that the top qualifier's



A killer Serpent Excel with a cool Rain-X paint job.

time in 1/10 scale beat the top qualifier's time in 1/8-scale 2WD on the same track. The 1/10 scales were flying!

- **1/8-Scale 2WD Qualifying.** In 2WD, it was Kyle Wilson and Dave Campbell trading the TQ back and forth. In the end, Wilson took the TQ with 19/5:07.97 with Campbell only 1/3 second behind. Shawn Murray's PB closed out the top three only 2.93 seconds behind. The A-Main in 2WD was set with five Deltas, three BMTs and two PBs.

- **1/8-Scale 4WD Qualifying.** In 4WD, the qualifying was as hot as the Texas sun. BMT's Ralph Burch Jr. grabbed the TQ with a ballistic 21/5:08.10. Serpent's Tommy Ramundo was only 1/2 second behind. Current national champion Chris Tossolini's BMT rounded out the top three only .09 sec-



The RCRC drivers' stand.



BIGGIE



title in the Lone Star State



Racers receive instructions at the morning driver's meeting.

ond behind Ramundo. The top three drivers were separated by a little more than 1/2 second. The A-Main promised to be an extremely tight, fast race. The Main was set with five Serpents, three BMT's, one Parsec and one PB.

During Sunday's qualifying rounds, many racers in the pits watched the Indy 500, and more than one driver remarked that Indy cars and R/C cars looked a lot alike when they hit the wall!

THE MAINS

Monday morning started out looking like rain, so the Mains were reduced by 5 minutes to ensure that they all were completed.

• **1/10-Scale A-Main.** At the start of the Main, Dave Campbell and Art Carbonell broke from the pack. For the first 3 minutes, less than 15 feet separated these two cars. Scotty



Barrera was in third waiting for the leaders to make a mistake. Right after the 3-minute mark, Barrera got his wish. Campbell flipped his car, and Carbonell took the lead and never looked back. Back in the pack, Campbell's problems continued to mount and, eventually, he pulled his car off the track. Barrera was in second place with Tommy Ramundo hot on his tail, but at around the 8-minute mark, Ramundo got around Barrera and took second. Shortly after that, Carbonell passed Ramundo and put him a lap down. For the next 10 minutes, the top three remained the same. At the 18-minute mark, Barrera's car started to have handling problems, and Jimmy Piersol pulled into third. Meanwhile, Carbonell's Impact was cruising; he had already lapped the field twice and was on autopilot. With less than 6 minutes to go, Ramundo's car flamed out, and this shuffled the top three. Art retained the lead, Jimmy pulled into second, and ninth-qualifier Brian Bodine took over third. At the end of 30 minutes, Carbonell took the win with three laps over Piersol's second-place

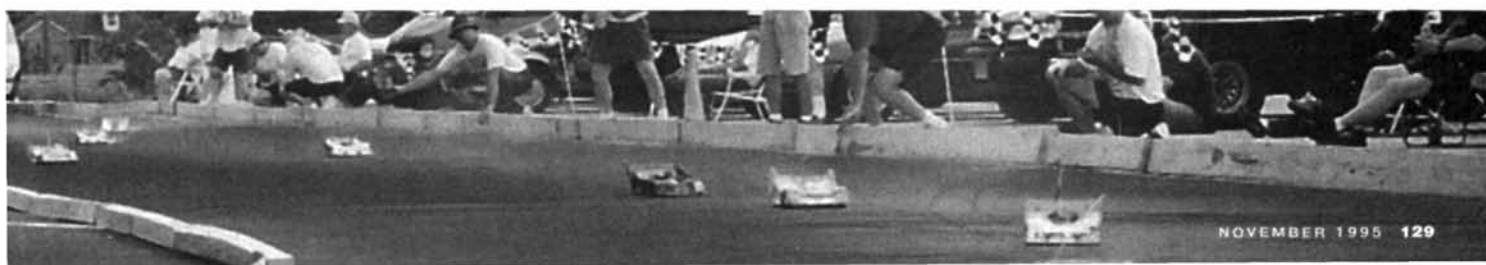


car. Third-place finisher Bodine was 5.60 seconds behind Piersol.

• **1/8-Scale 2WD A-Main.** After a 10-minute break, it was time for the 2WD A-Main. Would the heat get to Dave Campbell? Would Kyle Wilson hold on for the win, or would defending national champ Chris Allison pull it out? At the start, Campbell and Wilson broke away from the field. Back



in the pack, third place was shared by numerous drivers because of the mysterious "hammer effect." Tommy Porfirio broke a rear hub on the first lap and had to pull his car. After the first round of pit stops, Allison pulled into the lead for a very short time. Campbell took the lead at the 7-minute mark with Allison in second and Piersol in third. At this time, the field was spread out, and the positions remained fairly constant as racers



WINNERS' CHART

1/10-SCALE A-MAIN

Pos	Qual	Laps	Name	Car	Engine	Body
1	2	108	Art Carbonell	Serpent	Mega	Dahms
2	7	105	Jimmy Piersol	Delta	Nova/Rossi	Dahms
3	9	105	Brian Bodine	BMT	Nova/Rossi	Dahms
4	4	101	Tommy Ramundo	Serpent	Mega	Dahms
5	6	101	Mike Queller	BMT	OPS	Dahms
6	5	94	Frank Calandra	Serpent	Mega	Dahms
7	8	91	Scott Barrera	PB	Nova/Rossi	Dahms
8	TQ	90	Dave Campbell	Delta	Nova/Rossi	Dahms
9	10	88	Rudy Williams	BMT	Nova/Rossi	BMT
10	3	84	Don Jones	Serpent	Mega	Dahms

1/8-SCALE 2WD A-MAIN

Pos	Qual	Laps	Name	Car	Engine	Body
1	2	110	Dave Campbell	Delta	Nova/Rossi	Lola
2	4	108	Chris Allison	BMT	TQ-10	Lola
3	9	105	Sean Cochran	Delta	Nova/Rossi	Lola
4	10	105	Brent Gottfried	Delta	Nova/Rossi	Lola
5	3	104	Shawn Murray	PB	Nova/Rossi	PB Jag
6	7	103	David Murray	PB	Nova/Rossi	PB Jag
7	5	95	Jimmy Piersol	Delta	Nova/Rossi	Lola
8	TQ	43	Kyle Wilson	BMT	Nova/Rossi	Lola
9	8	34	Steve Smith	Delta	Nova/Rossi	Lola
10	6	DNS	Tommy Porfirio	BMT	TQ-10	Lola

1/8-SCALE 4WD A-MAIN

Pos	Qual	Laps	Name	Car	Engine	Body
1	5	118	Art Carbonell	Serpent	Mega	Lola
2	3	118	Chris Tossolini	BMT	OPS	Lola
3	7	116	Frank Calandra	Serpent	Mega	Lola
4	1	115	Ralph Burch Jr.	BMT	TQ-10	Lola
5	10	115	Don Jones	Serpent	Mega	Lola
6	9	113	Josh Alton	Serpent	Mega	Lola
7	8	113	Davy Preston	BMT	TQ-10	Lola
8	6	107	Eric Davis	Parsec	Roem	Elfin
9	2	92	Tommy Ramundo	Serpent	Mega	Lola
10	4	56	Scotty Barrera	PB	Nova/Rossi	PB Jag

waited for the other drivers to make mistakes. At the 12-minute mark, TQ Wilson's car developed problems, and he was unable to continue. Piersol's third-place car had handling problems, and this allowed ninth-qualifier Sean Cochran to move into third at around the 15-minute mark. After 30 minutes of racing, it was Campbell in first, Allison in second and Cochran in third. Brent Gottfried, who bumped up from the B-Main, finished fourth with less than 5 seconds from third.

• **1/8-Scale 4WD A-Main.** The stage was set for the final race of the day. Who would win the bragging rights to this shootout? As the green flag dropped, Ralph Burch Jr. jumped into the lead with Chris Tossolini right behind him and Eric Davis in third. For the first 3 minutes, Burch was in first, but Tossolini—waiting for a slight miscue or a bauble—was never more than 10 feet behind him. Frank Calandra had moved into third.

At around the 3-minute mark, Tossolini kissed the wall and got stuck on the board, but he was able to drive it off the wall. This gave Burch a little breathing room. At 5 minutes, Burch hit the wall, which allowed Tossolini to take the lead. After the first round of pit stops, Burch pulled out to a 5-second lead. After the second round of pit stops, he continued to lead. Back in the pack, Carbonell, who was making up ground after flaming out, moved into second at around the 12-minute mark. With Tossolini in third, Burch continued to lead until around the 15-minute mark when he flipped his car on its roof, which allowed Carbonell to take the lead. For a few minutes, Josh Alton moved into third, then Tossolini began his charge from fourth. He passed Alton and was gaining on Burch, who appeared to be having traction problems. Tossolini caught Burch, and they both tangled and lost precious time to Carbonell. Tossolini got around Burch and into second. With less than 10 minutes left, it

was Carbonell in first, Tossolini in second, Alton in third, Burch in fourth and Calandra in fifth. After the last round of pit stops, Carbonell had a 1/2-lap lead over second and started to conserve the car. Burch's car wasn't running as well as it had been, and it continued to fall back. As the buzzer sounded, Art Carbonell passed the finish line to win the 1995 Texas Biggie 4WD Championship. A hard-charging Chris Tossolini finished second only 1.37 seconds behind first place, and Frank Calandra passed Ralph Burch Jr. to take third.

As the sun set over the 18th Annual Texas Biggie and the smoke cleared, a great weekend of racing was complete. Congratulations to Art Carbonell and David Campbell on their championships. On behalf of all the racers, a hearty thank-you goes out to Dallas RCRC, Speedline, RCM, Delta, PB, BK Racing Fuel, Indy RC Race Management, Heart Of Texas Hobbies and all the other sponsors of this race. ■

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Track Tune-Up



Left: just before their new racing season began, the Hague R/C club of the Netherlands completely rebuilt this large paved oval and off-road track. From the bi-level drivers' stand (above), each driver can easily monitor the racing action.

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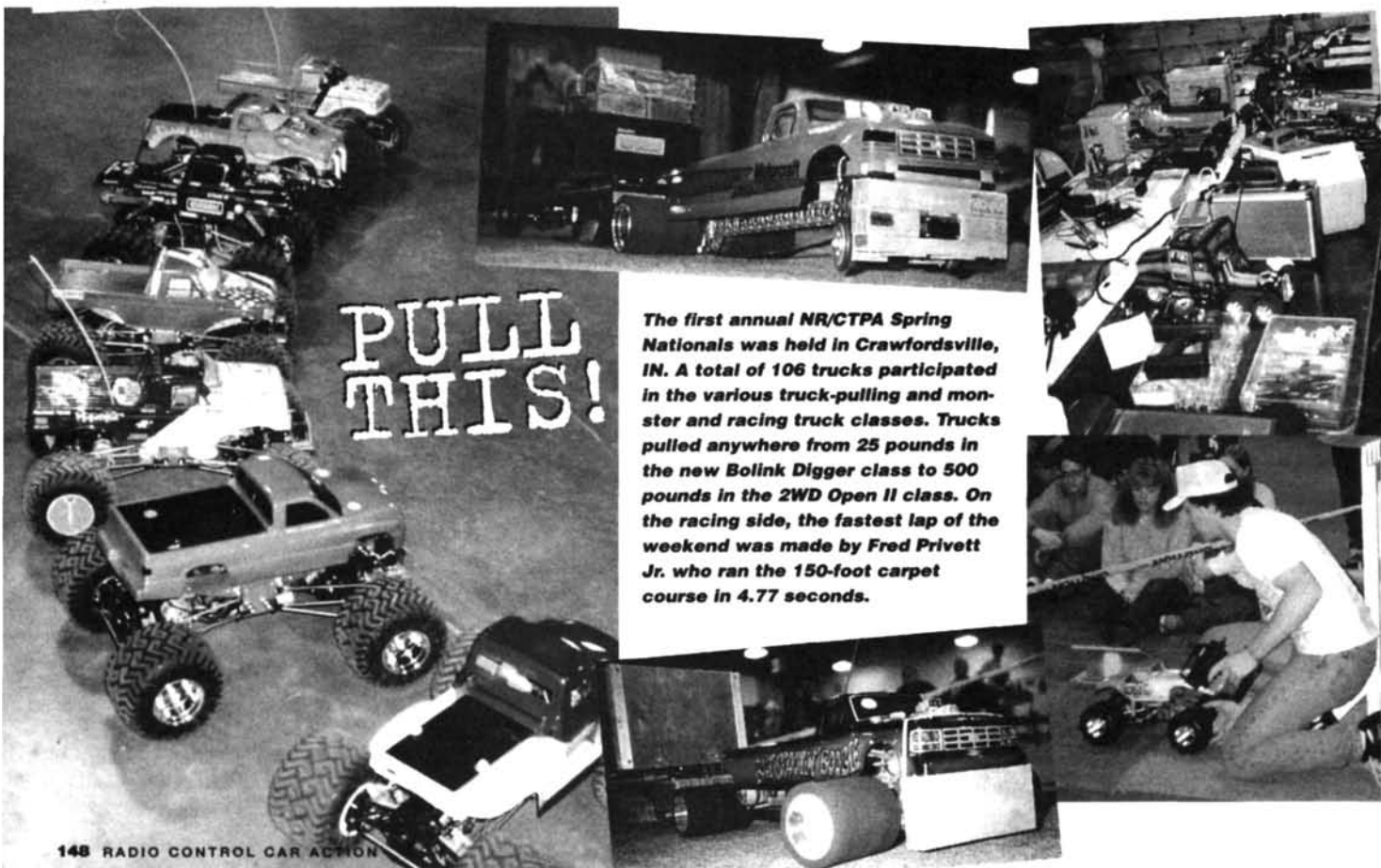
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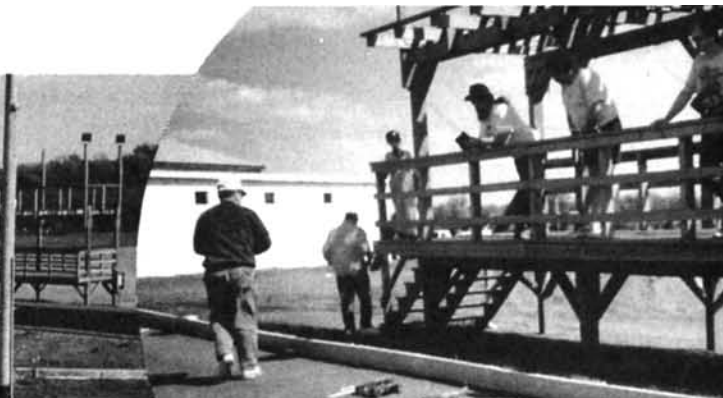
The first annual NR/CTPA Spring Nationals was held in Crawfordsville, IN. A total of 106 trucks participated in the various truck-pulling and monster and racing truck classes. Trucks pulled anywhere from 25 pounds in the new Bolink Digger class to 500 pounds in the 2WD Open II class. On the racing side, the fastest lap of the weekend was made by Fred Privett Jr. who ran the 150-foot carpet course in 4.77 seconds.



Zoom at the Shroom



Above: here's the Mushroom Bowl R/C Speedway in Kennett Square, PA. The waterfront hobby shop and asphalt oval track attract many racers each week. Right: Jacob Walter, Bruce Michener, Mike Mandio, John Swyka and Larry Coddington wait for Al Spina to join them on the drivers' stand for the Stock Pan Sealed Motor race. Jacob, who is only seven years old, gives the big boys a run for their money. For racing information, call Drew or Bruce at (610) 444-1859.



Hobby Works Hosts Tamiya Race ^{NO 14}

by Doug Mertes

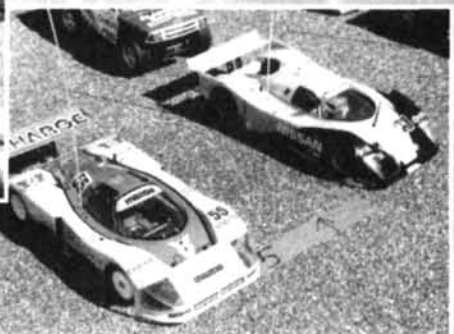
The morning dawned bright and hot for this latest leg of the Tamiya R/C Championship series. Race director Steve Greer and the staff from Hobby Works in Laurel, MD, had set up the track and sprayed its surface with root beer to provide optimum traction. Tamiya's director of competitions, Eric Sands, was on hand to ensure that the race was run in accordance with the company's regulations. He even brought Tamiya's traveling race setup: lengths of bright orange fire-hose lane marker, corner dots, a laptop computer, and their electronic lap counting and scoring system. The field comprised F1, Sedan, and GTP/Group C entries, and both Stock and Modified classes were available.

The qualifying races went off without a hitch, each round taking about an hour to complete. Following an hour-long lunch break after the second qualifier, the racers reconvened for the semifinal elimination rounds.



Soon, it was time for the finals. By then, the temperature had climbed to a sunny 82 degrees, but anticipation caused more than a few racers to wind up with sweaty palms on the drivers' stand! The horn sounded, the 10 fastest and most consistent stock F1 cars leaped off the starting line, and a terrific tangle of open-wheel Lexan and tire foam ensued in the first turn. When all the dust had settled, top qualifier Alex Kikel had captured first place by staying clean and accident-free.

The Sedans were up next. This was a controversial class because the top five modified cars held positions one through five, and the top five Stock-class cars held positions six through 10. At the



sound of the tone, all 10 cars jumped off the grid and slammed through the first series of corners. They ran with elbows out, rubbing doors and jostling for position, with little concern for the more gentlemanly aspects of racing. These guys were out for blood! At the end, it was Dave "Four-wheel drift" Cole of Oklahoma who took the Mod class win, with local driver Todd Marshall in second place. I took the Stock class win and fourth overall, followed by Ken Shipe in second.

The GTP class was another Dave Cole show. He got out in front early and never lost the lead. The second-, third- and fourth-place drivers swapped places so often that it was hard to tell them apart without the computer. In the end, it was Dave all the way; Al DePoalo from NHS Racing in New York wound up with the second-place finish (he bought and built the car the night before, with some help from his buddies), and local Scott Dermer was third.

All in all, it was a great day of racing! Thanks, Tamiya, for supporting this kind of grassroots racing effort!

WINNERS

F1 STOCK

- 1—Alex Kikel
- 2—Charles Ledbetter
- 3—Carlton Coleman

SEDAN STOCK

- 1—Doug Mertes
- 2—Ken Shipe
- 3—Rob Becker

GTO & GTP MODIFIED

- 1—Dave Cole
- 2—Al DePoalo
- 3—Scott Dermer

SEDAN MODIFIED

- 1—Dave Cole
- 2—Todd Marshall
- 3—John Hauffer

TOP F1 ROOKIE

- Dustin McGinn

TOP SEDAN ROOKIE

- Joshua Robinson

BEST OF SHOW SEDAN

- Tristan Stains

BEST OF SHOW GTP

- Jack Moschetto

BEST OF SHOW F1

- D.J. Belisario



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The 30th of each month, 3 months in advance; i.e., Nov. 30 for the March issue.

PAYMENT

All ads must be paid for in advance. Multiply your payment by the number of months you want it to run.

AD TO READ

(Attach an additional sheet if necessary)

HEADING _____

COPY _____

No. of words _____ No. of months _____ Total enclosed _____

SEND AD AND PAYMENT TO: RCCA CLASSIFIED ADS,
Elise Silkowski, 251 Danbury Rd., Wilton, CT 06897
For more information, call (203) 834-2339.

FOR OFFICE RECORDS ONLY

Name _____

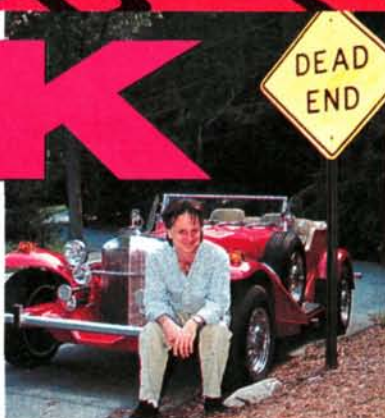
Address _____

City/State/Zip _____

Phone () _____

Would you like space advertising information YES ☐ NO ☐

BACK LOT



This is my page—mine!

The opinions expressed on this page do not necessarily represent the opinions of the entire *Car Action* staff. Any resemblance to reality is purely coincidental. Send your correspondence, hate mail, love letters, photographs—anything you like—to Chris's Back Lot, c/o RCCA, 251 Danbury Rd., Wilton, CT 06897. My internet address is: chris@airage.com

Clean it up or watch it fade away

This letter from Justin Norris disturbed me greatly, as it should you ("you" being hobby shop and track owners). Unpleasant track environment is right up there with runaway costs as a threat to our hobby. It's often the insidious cause of track closings—very bad for the hobby.

As a track manager, you must make your track a comfortable place to be—a place parents feel safe taking their kids to. If you allow a loud-mouthed, beer-guzzling loser clique to make your track their personal club house, your business is done for. It's simply a matter of time....

Dear Chris,
I'm writing to you about the track scene. I go to an indoor off-road R/C track about once a week to have fun. But every time I go, there are more people who give me the finger and stuff like that. Every once in a while, I see some guy standing waiting for his frequency baton, and he smiles and turns on his radio just so he can piss somebody off by seeing a car fly into the wall and explode. That really pisses me off!

You barely ever see anyone having FUN. Whatever happened to HAVING FUN?!

I hope you do an article on this subject and publish my letter.

JUSTIN NORRIS
Santa Ana, CA



P.S. You seem like the funniest guy. I wish I could meet you. Because of your column, I read *Car Action* backwards.

Justin, thanks for the letter and compliment. I'm really glad some of you guys like what I do. You're 100-percent right: fun is where it's at. Unfortunately, wherever you go and whatever you do, there will always be a jerk or two under a nearby rock. It's a fact of life we all have to deal with. Many times, these people are angry, lonely little slugs with no real friends, and they take it out on others because they can't get

dates. They'll always attempt to drag you into their misery. Don't let them do it; the misery is theirs, not yours! Just be happy; it's the greatest "revenge" against jerks. They can't handle it.

Oh, yes, then we have the serious meanie. You know the type. Sometimes, I think they really do think they're in a full-scale F1 race! Better not get in their way. How ridiculous! This is only 1/40-scale R/C car racing—intended to make us smile, not growl. Get a life! Can you imagine the interesting weekend social events these clowns attend? A very full schedule, I'm sure. Yea, right!

Now, I realize that there are times when things can get way out of hand—drinking, fighting in the parking lot, intentional ramming of cars, frequency sabotaging, yelling profanities; you name it. This is the track owner's fault; end of story. I don't care what kind of track it is—indoor, outdoor, on-road or off-road—but all owners must realize it's their responsibility to create a pleasant, family-oriented environment in which patrons feel at ease, or they'll soon be without patrons and without a business. Justin, let the track owner know, in a civil way, that you're a paying customer and you don't like what's going on.

CC

P.S. You never know Justin; maybe we will meet someday.



Now, what's the first question this photo raises? My question was: who is she? For those like-minded, she's Celeste Lichtenberger—Miss South California. If you want to know about the other two (Associated drivers Mark Pavidis and Greg Dennett), turn to the full coverage of the NORRCA Off-Road Nationals by George Gonzalez in this issue. ("Back Lot" photos are always bigger.)

Now, Hobby Shack knows how to run a race in which everyone feels included and no one gets offended; the management sees to it! Here are shots of their latest parking-lot event at La Habra, CA—over 130 entrants! Left: "un-curbed"



retriever matches its namesake.

Below left: Lindsey Johnson and her Tamiya Stadium truck.



Right: at the high-speed lot, Austin White instructs Jon Graziano on F1 setup. Below right: the beautiful parking-lot setup at La Habra. Get in on the family race action at one of Hobby Shack's nine locations. Call (714) 964-8846.

